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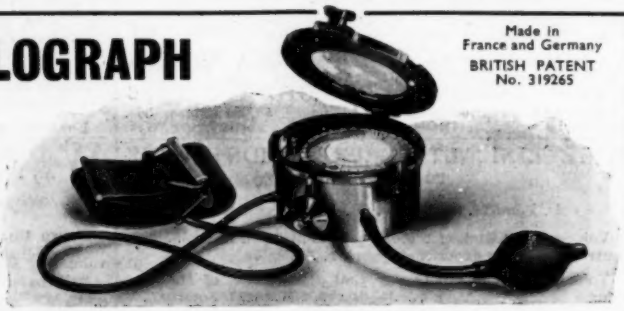

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(WITH ILLUSTRATIONS ON PLATE)

The latter half of the nineteenth century saw a rapid expansion in all branches of ophthalmic surgery, largely stimulated by the successful work of von Graefe and his pupils, and at this time great interest was taken in early experimental keratoplasty. Although de Quengsy in 1789 had mooted the idea of a transparent glass implant in the cornea, it was not until 1824 that Reisinger attempted to graft living cornea in rabbits. He was not successful, and further attempts by Mulbauer and Durr in 1877, also using rabbits, met with similar results.

A. von Hippel was the first surgeon to demonstrate, at the International Congress in Heidelberg in 1888, a successful case of corneal graft in a rabbit. He described two methods: (1) that in which a partial thickness of the cornea was employed (lamellar); (2) that in which the whole thickness of the cornea was removed (circumscribed penetrating) (Fig. I. *a* and *b*). He used a circular trephine of his own device but without any method of fixation of the graft. It is on this worker's pioneer technique that the modern operation of keratoplasty depends. The lamellar method, which appeared safer in those early days, was used by several workers, and the first successful case of human corneal grafting by it was demonstrated by Zirm in 1906, in a case of dense corneal scarring following a lime burn. Modifications followed in rapid succession. Lohlein in 1909 used a vertical strip of cornea together with attached conjunctiva. Wiener removed superficial scars and allowed the raw surfaces to epithelialise, but the method of partial keratoplasty was finally abandoned since the implants were not permanently transparent.

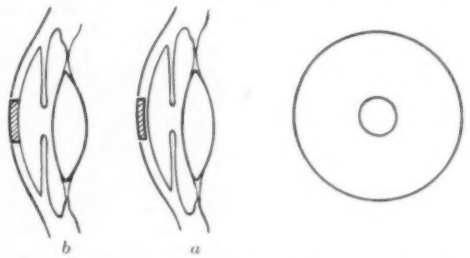

FIG. I.—Von Hippel: (*a*) lamellar keratoplasty; (*b*) circumscribed penetrating with no special method of fixation.

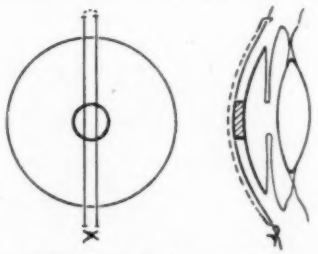

FIG. II.—Elschnig: Circumscribed penetrating keratoplasty with bridle fixation suture. Miosis.

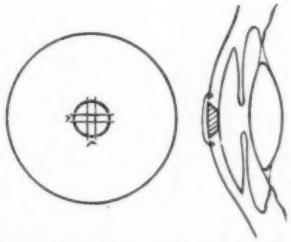

FIG. III.—Thomas: Corneal fixation suture, bevelled graft. Miosis.

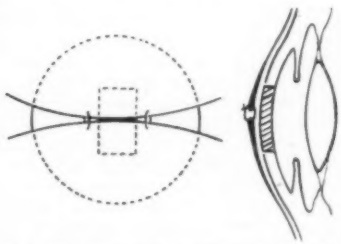

FIG. IV.—Castroviejo: Rectangular graft. Vertical flap.

About the year 1910 Elschnig and his assistants commenced a series of operations which in 1930 had reached a total of 172 cases. Their results, which have never been surpassed, removed the operation of keratoplasty from the experimental to the therapeutic stage. These workers claimed successes—that is to say, clear corneal grafts—in 22 per cent. of all cases and in 73 per cent. of cases of interstitial keratitis. Several patients were improved to a vision of 6/6. The technique of the operation constituted rigid preliminary aseptic routine, van Lint facial block, retrobulbar anæsthesia, and the Elschnig fixation suture (Fig. II.). A Hippel trephine was used to prepare the graft and the whole of the thickness without any bevelling of the edges was employed, the pupil being in a state of miosis. The size of the trephine was 4–5 mm. Thereafter the graft was kept between layers of dry gauze and fixation was obtained by a bridle suture running over the graft; in 22 cases, flaps also had to be employed (Fig. II.). The conclusions which Elschnig reached were that the penetrating method of keratoplasty was the method of choice, that the blood group of host and donor had no relationship to the subsequent transparency of the graft, that the graft could be removed from an eye which was not necessarily healthy provided it was transparent at the time of removal, and that the younger donors provide the better grafts.

Within the last five years there have been many modifications of this method. Filatoff uses ribbon flaps of conjunctiva to keep the graft in place, having previously protected the lens and iris by a strip of celluloid inserted behind it. Egg membrane is also used as a protective. Tudor Thomas (Fig. III). bevels the edge of the graft and employs a slightly larger trephine to cut the bed. Olive oil is used as a vehicle and protective dressing, and corneal sutures are used for fixation (Fig. III.). Castroviejo uses parallel knives and cuts a rectangular graft using conjunctival flaps for fixation (Fig. IV.). The procedures of Morax and Kraupa should be noted at this stage (Fig. V.). Morax employs auto-transplants from the same cornea. This is necessarily of the lamellar type, and there is an interchange of corneal discs so that the opaque disc is placed at the

periphery and a clear disc is placed over the nebula. Kraupa employing the circumscribed penetrating method rotates the graft, which is composed partly of scar tissue and partly of clear cornea. Rotation brings the clear segment of the graft into the pupillary line and diverts the scarred portion to the periphery. Key had attempted to graft the whole of the cornea but without success.

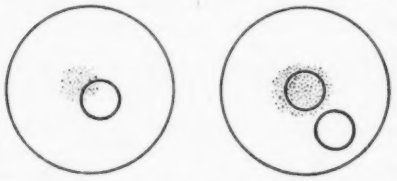

FIG. V.—(*a*) Kraupa: Rotation of graft. (*b*) Morax: Transposition of graft. Lamellar method.

The Author's Method

I employ the following method (Fig. VI.). A general investigation of the host and donor is undertaken; gross focal sepsis is removed and general disease eliminated; the Wassermann reaction in the donor must be negative. There must have been no active disease in the eyes for at least a year before keratoplasty can be undertaken. The usual preliminary cataract precautions are taken such as ensuring patency of the lacrymal ducts and sterility of the conjunctival sac; there must be no severe cough or prostatic obstruction. Preliminary treatment is carried out for one week, with four-hourly irrigations of hydrarg. oxycyanide lotion 1 : 8000, together with local ultra-violet radiation of three minutes' duration daily by the full spectrum of the mercury-vapour lamp. The projection of the eye is accurately measured and the response must be brisk. Retro-illumination determines the position of the pupil and the presence or not of gross lens opacities; this is important in determining the precise site for the graft. On the day before operation the state of the bowels is attended to in the usual way, and atropine is instilled at night into the host's eye. I have given up the use of miotics for reasons stated later. On the morning of operation Medinal grs. 7½ is given one hour before the projected time of operation. The patient is operated on in bed and not lifted on to an operating table.

OPERATION

The preparation of the site in the host and the enucleation of the donor's eye are begun simultaneously. Anæsthesia is obtained by 4 per cent. cocaine and retrobulbar injection of novocain with adrenaline so as to reduce the tension of the eye and prevent expulsion of the intra-ocular contents. Facial akinesis by the method of O'Brien is a routine procedure. In the host a complete flap is prepared circumscribing the limbus and separated well back to the equator of the globe. A purse-string suture (No. 1 black silk Mersuture) is inserted close to the edge of the conjunctiva in such a way as to render the aperture eccentric when tightened. A 4 mm. circular graft is delineated over the precise site of the pupillary aperture which has previously been determined and may have been marked on the nebula by methylene-blue (Elschnig), and the whole thickness of the cornea is cut through. In early cases I practised the shelving method of Tudor Thomas but recently I have abandoned this because there is little risk of losing the disc, and the shelf of up to 1 mm. reduces the available portion for vision of the 4 mm. graft to 2 mm. posteriorly and there is a risk of Descemetitis covering this small aperture later. During these manœuvres the eye is constantly irrigated by normal saline at body temperature, and when the graft is cut through in one portion, the aqueous is slowly evacuated, and the section completed by scissors and fine protected forceps. The same procedure is carried out in the enucleated eye using Tudor Thomas's apparatus for holding the globe.

The graft is then transferred to normal saline lotion at body temperature, and from there to the bed by means of a lens spoon, care being exercised to see that it is not turned upside down. It is manœuvred into position by means of the iris repositor, the assistant at the same time gradually tightening the purse-string suture so that the graft gradually disappears from view as the conjunctiva closes over it. When the conjunctiva is tied off and allowed to fall back the graft is held securely in position by the natural strap over the cornea. No suture touches the graft since it is entirely covered by conjunctiva. A retention stitch fixes the upper lid to the cheek and ordinary postoperative cataract routine is instituted.

Aspirin, grs. 10, is given after the operation, and as a rule there is no pain and very little discomfort. The eye is not dressed for three days, after which the graft usually appears opaque and can be dimly seen through the widening conjunctival aperture. At the end of the first week more of the graft is visible, and it is slowly beginning to clear; on the tenth to the fourteenth day the stitch either cuts out or is removed and the conjunctiva slides back. Atropine mydriasis is continued from the first dressing. It is of importance to keep the patient in bed for at least a month, since the linear scar is weak and there is a tendency to prolapse if the patient in his enthusiasm attempts to do too much.

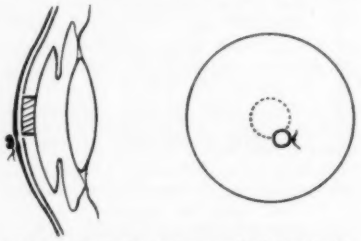

FIG. VI.—Rycroft: Circumscribed penetrating keratoplasty. Complete conjunctival flap. Mydriasis.

INDICATIONS

Indications for the graft of a cornea are clearly defined.

(1) Vision must be reduced, to perception of hand movements, by a corneal scar.

(2) Uveal tissue must not adhere to the scar; this must be separated off before a graft is undertaken.

(3) The pupillary aperture must be bright and mobile by retro-illumination, although successful cases of graft have subsequently had a cataract removed.

(4) Glaucoma must be absent.

(5) The projection of light must be accurate and brisk.

(6) There must be an absence of disease in the host and of syphilis in the donor.

Suitable cases result from chemical burns, healed interstitial keratitis and corneal ulceration without iris prolapse, and the definition of a successful case is that the graft is in place one year after operation and has retained transparency throughout that year with a maintenance of vision. Filatoff put the period of nine months. Donor grafts may be obtained from

cases of sarcoma, detached retina, absolute glaucoma without œdema, old iritis, and cases of recent injury.

OPERATIVE COMPLICATIONS

1. *Prolapse.*—In one case a large graft of 6 mm. was used and a prolapse occurred at the end of the first week. This was excised satisfactorily but the transparency of the graft was affected by the trauma. With 4 mm. grafts there has been no prolapse, and it would appear that a larger wound takes longer to heal and the risk of prolapse is correspondingly greater. Furthermore I now employ mydriasis as the preventive before, during, and after the operation, since with the loss of aqueous the pupil contracts in any case and protects the lens so that miosis seems to be unnecessary; it appears to favour incarceration of the iris in the wound two or three hours after operation.

2. *Difficulty of fixation of the graft.*—I now use a complete graft without bevelling of the edges following the method of Elschnig, who had only 1 misplaced graft in 172 cases. Furthermore this shelving tends to make the accurate fixation of the graft difficult and certainly diminishes the posterior visual aperture of the cornea and increases the linear scar area. Corneal sutures predispose to a localised opacity and cross stitches may interpose themselves between the lips of the graft (Castroviejo). The object of the complete conjunctival flap as described is to give a uniform pressure over the graft with an absence of irritating foreign substances. The swelling of the graft rapidly fixes it in position in the cornea, and the same size of trephine is used for host and donor.

3. *Sepsis does not occur frequently.*—Elschnig gives one case of necrosis in his series, and with careful preliminary technique it is possible to avoid this, especially if the site of the graft is carefully covered by conjunctiva.

4. *Opacification of the graft.*—There are three types of opacity. The first comes on during the first week, and is the result of the imbibition of aqueous humour into the substantia propria; it rapidly clears up towards the end of the first week. The second is due to vascularity from the spread of superficial vessels towards the end of the second week; this takes longer to clear but is not permanent. The third opacification comes about the end of the first fortnight, and is due to a failure of nutrition in the graft, and is permanent. In successful cases the area outside the graft also clears to a certain extent.

The Use of Animal Grafts

For many years the earlier workers were hampered by the limitations of their material. Von Hippel employed grafts from rabbits and dogs without success. This has been often repeated with the same results up to the present day, and it appears quite definite that grafts from animals cannot be successfully employed in the human. Grafts from cadavers may be employed provided they are taken within an hour of death as described by Filatoff. Magitot has kept a graft transparent for four weeks in hæmolysed serum. Salzer and Ortin after many experiments have come to the conclusion that autotransplants—i.e., transplants from the same person or same cornea (Kraupa, Morax)—are best, that homotransplants from the same species may be successful, but that heterotransplants from different species are never successful. Tudor Thomas has reported the use of devitalised corneal tissue in rabbits and has pointed out that there is a general firm union with the thinning of the linear scar and very little reaction.

Illustrative Cases

The following three cases are examples of corneal grafts after six, nine, and twelve months.

CASE 1.—A man, aged 52, in 1930 had a severe attack of interstitial keratitis of the right eye and was treated by Mr. N. L. Pines who recommended the removal of unerupted wisdom teeth. The result of this operation was that the acute condition subsided, and in 1932 the eye became quiet with a vision of perception of light (Fig. VII. a on Plate). In May, 1935, keratoplasty was decided upon, although the condition was unilateral, and preliminary investigation was undertaken. For many weeks conjunctival culture showed *Staphylococcus aureus* until finally, by vigorous ultra-violet radiation, silver nitrate, and the usual applications, a clean culture was obtained. A 4 mm. graft was employed, the donor being a woman who had suffered complete retinal detachment and old iritis. The patient has made an uninterrupted recovery and six months later is able to go about by the aid of this eye alone which has vision of 6/60 and a full field. Colour vision is normal, and he is able to read the headings in a newspaper. The cosmetic result is excellent and the graft is steadily clearing (Fig. VII. b).

CASE 2.—A woman, aged 49, has suffered since the age of 7 from ulceration of both eyes and was treated for some years by curettage of the cornea and instillations of dionine. Since 1930 there has been no treatment. On admission to hospital for keratoplasty both corneæ showed a central nebulæ of medium density; vision was perception of light, and in each eye there was no organic disease of the patient. The tension of the right eye was 30 and of the left 26, and the left was accordingly chosen for corneal graft. With the technique described, using a 6 mm. graft, keratoplasty was carried out. Five days after the operation the patient was able to see a dim form in a bed across the ward, to make out the windows of the ward, and to see chimneys on adjacent houses. But on the tenth day there was a prolapse of the iris which had to be excised. Thereafter the transparency of the graft failed and the vision to-day has been reduced to counting of fingers, which was better than it was before the operation.

CASE 3.*—The third case was shown to the section of ophthalmology, Royal Society of Medicine, in January, 1935. The patient was a woman, aged 48, who had had the right eye removed for tuberculous keratitis, and whose left cornea showed healed opacity which had reduced her vision to perception of light (Fig. VIII. a on Plate). She had been certified for the Blind Register and had ceased treatment in November, 1934. Complete investigation was carried out, and a 4 mm. corneal graft was obtained from an accident case and inserted into the patient's cornea by the above method. Convalescence was uneventful, and we demonstrated the case at a vision of 6/24 with correction and J 6 (Fig. VIII. b). One year after operation the graft has still maintained its transparency; there is a good deal of thickening of Descemet's membrane on the posterior corneal surface but the pupillary gap remains wide enough to afford a vision of 6/36; the anterior chamber and iris are seen to be normal. There is no ectasia of the scar and the tension is normal. Vascularisation is absent except for a few superficial conjunctival vessels.

During the last year the patient has gone about the streets on her own and made bus journeys alone. She is able to read newspapers and write good manuscript. She attends and enjoys the cinema, and is able to do her own housework. For reading fine print, J 4, she employs telescopic spectacles, but for ordinary purposes the unaided eye is used. She reports that she finds it difficult to express her feelings at being able to see again after having resigned herself to a life of blindness.

I have received much valued assistance from the senior house surgeons at the Royal Eye Hospital, Mr. G. Handelsman and Mr. R. H. Rushton who were responsible for the preliminary investigations and for assistance during the actual operations; to them I am gratefully indebted.

* The history of this patient up to last March has been recorded in the British Medical Journal (1935, i., 919).

(*Bibliography at foot of next page*)

EFFECT OF SEX HORMONES ON THE PROSTATE OF MONKEYS

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I.—The Effects of Male Hormone

ALTHOUGH a beginning has been made in the clinical use of male hormone preparations, our experimental knowledge of the effects of the hormone on the accessory reproductive organs relates only to small rodents. The present investigation on immature monkeys provides information about corresponding effects on accessory reproductive organs homologically similar to those of man.

Such an investigation does not appear to have been made as yet, and indeed there have been practically no studies even of the secondary sexual characters of monkeys and apes, in many species of which they are exceptionally well marked. Antonius [1] reports that the very conspicuous cape of hair of male hamadryas baboons disappears, and the pelage changes to the female type after castration. We can confirm his statement on the basis of a similar experiment of our own, but apart from these two observations, we know of none that relates to the endocrinology of the testis in subhuman primates.

INVESTIGATION

Material.—Seven normal immature male rhesus monkeys (*Macaca mulatta*), whose weights and approximate ages are given in Table I., were used in this study. One was injected daily with 10 capon units * of "Enarmon" urine concentrate, for which we thank Dr. Itoh, Teikokusha Institute, Kawasaki. Three were injected with an oil solution of "synthetic" androsterone,[2] and three with an oil solution of "synthetic" androstanediol [3] (di-hydro-androsterone). (See Table I.) For both these preparations we are greatly indebted to Prof. L. Ruzicka and Messrs. Ciba Ltd.

An extensive control series of normal animals was available.

TABLE I

Administration of Male Hormone to Immature Male Rhesus Monkeys

No. of animal (MM.).	Body-weight (g.).	Approx. age in months.	Nature of preparation.	Amount injected daily.	Days injected.	Total units given.
10	3200	38	"Enarmon."	10 C.U.	10	100
24	1800	20	Androsterone.	10 mg.	10	1000
30	2700	24		2·5 ,,	22	550
31	2700	24		5 ,,	22	1100
52	2700	24		5 ,,	12	1800
53	3800	24	Androstanediol.	5 ,,	20	3000
78	2680	24		5 ,,	28	4200

* At the time this assay was made no standard of reference was available, but 1 "capon unit" as then used by us is now known to correspond almost exactly to the activity of 100 γ of androsterone, the prospective international unit of male hormone activity.

EXPERIMENTAL RESULTS

External changes.—Swelling and coloration of the skin of the external genital organs, anus, and surrounding areas, such as develop during injection of œstrone, did not occur during any of the present experiments with male hormone. The external genitalia were unexceptional in all the monkeys except MM. 53, which differed from the other experimental animals in that its testes at autopsy were at the base of a well-developed scrotum. Since, however, the testes were still undescended in MM. 78, in which injections of androstanediol were continued for longer than in the case of MM. 53, it is difficult to ascribe the position of the testes in the latter to the injections, and it is possible that the animal had already reached the age for testicular descent.

There was a suggestion in the behaviour of MM. 78 that its responses became more aggressive, and its social position in the cage, which it occupied with two other males of the same age, more dominant towards the end of the treatment.

Internal changes.—With the exception of MM. 10, the prostate and seminal vesicles of all the injected animals are larger than those of the normal controls. The seminal vesicles show the usual characters associated with the administration of male hormone in rodents [4] and need not be discussed here. Essentially they comprise rapid glandular development, and a relative and parallel decrease in the fibromuscular tissue (Fig. 1). The degree of response roughly corresponds to the number of units administered.[5]

The prostatic changes are confined to the prostatic glands proper and to their fibromuscular stroma, and,

(Continued from previous page)

MR RYCROFT: BIBLIOGRAPHY

Ascher, K. W.: Arch. f. Ophth., 1919, xcix., 339 1922, cvii., 241 and 439.
Bleringer, S.: Klin. Monats. f. Augen., 1933, xc., 43.
Castroviejo, R.: Amer. Jour. Ophth., 1932, xv., 835 and 905; 1934, xvi., 932. Proc. Staff Meet. Mayo Clin., 1931, vi., 417. Jour. Med. Soc. New Jersey, 1935, xxxii., 80.
Durr, H.: Augenarztliche Operationslehre (Elschnig), Berlin, 1922.
Elschnig, A.: Arch. Ophth., 1930, iv., 165.
Filatoff, W.: And There Was Light, 1933, ii., 18. Sovet vestnick. oftal., 1933, ii., 136 and 217; 1934, iv., 3, 192, and 222; 1934, v., 454; 1935, vi., 22. Arch. f. Augen., 1930, cii., 716; 1933, cvii., 153. Arch. Ophth., 1935, xii., 321. Eye, Ear, Nose, and Throat Monthly, 1933, xii., 273. Ann. d'Ocul., 1934, clxxi., 721. Arch. de oftal. Hisp. Amer., 1934, xxxiv., 451 and 475. Zeits. f. Augen., 1929, lxix., 279. Vrach. delo., 1933, xvi., 409.
Filatoff, W., and Velter, T.: Arch. f. Augen., 1932, cvi., 467. Sovet vestnick. oftal., 1932, i., 13 and 15; 1934, iv., 6.
Friede, W.: Klin. Monats. f. Augen., 1933, xci., 75 and 87. Arch. f. Augen., 1934, cviii., 568.
Galante, E.: Ann. de ottal. e clin. ocul., 1934, lxii., 117.
Gradle, H. S.: Amer. Jour. Ophth., 1921, iv., 895.
v. Graefe, A.: Trans. Ophth. Soc. U.K., 1934, liv., 119.
v. Hippel, A.: Arch. f. Ophth., 1888, xxxiv., 108.
Katz, D.: Arch. Ophth., 1933, ix., 331.
Kirwan, E. O.: Ind. Med. Gaz., 1935, lxx., 61.
Key, B. W.: Trans. Ophth. Soc. U.K., 1930, xxviii., 29. Arch. Ophth., 1931, v., 789.
Klauber, F.: Casop. lek. cesk., 1933, lxxii., 498.
Kraupa, M.: Zeits. f. Augen., 1914, xxxviii., 132.
Lagarev, V.: Sovet. vestnick. oftal., 1934, iv., 337.
Liebsch, W.: Arch. f. Augen., 1930, ciii., 603.
Lohlein, W.: Ibid., 1910, lxvii., 398.
Magitot, A.: Jour. Amer. Med. Assoc., 1912, lix., 18.
Manes, A. J.: Semana méd., 1929, i., 1209.
Morax, V.: Clin. Ophth., 1912, xix., 108.
Nizetu, H.: Klin. Monats. f. Augen., 1934, xciii., 89.
Ortin, G. L.: Atlas de la Soc. oftal. Hosp.-Amer. (Barcelona), 1914, xviii., 161.
Oradowskaya, E. I., and Velter, S. L.: Sovet. vestnick. oftal., 1935, iii., 8.
de Quengsy, P.: Quoted by Ortin, Med. Ibera, 1931, xx., 213.
Rosengren, T.: Hygiea, 1930, xlii., 826.
Reisinger: Augenarztliche Operationslehre (Elschnig), Berlin, 1922.
Rycroft, B. W.: Brit. Med. Jour., 1935, i., 919. Proc. Roy. Soc. Med., 1935.
Sauchez, M.: Rev. de cir. de Buenos Aires, 1934, xiii., 367.
Salzer, F.: Zeits. f. Augen., 1900, iii., 516.
Stallard, H. B.: Brit. Med. Jour., Jan. 18th, 1936, p. 106.
Thomas, J. W. T.: Proc. Roy. Soc. Med., 1930, xxiii., 75; 1933, xxv., 597; 1934, xxviii., 195. Trans. Ophth. Soc. U.K., 1930, i., 127; 1924, liv., 119; 1931, li., 96. THE LANCET, 1931, i., 335. Brit. Jour. Ophth., 1933, xvii., 529; 1934, xviii., 129. Proc. Roy. Soc., B, 1933, cviii., 301.
Vasyutinskiy, A. G.: Sovet. vestnick. oftal., 1935, vi., 29
Wiener, M.: E. Jackson Birthday Volume, Wisconsin, 1926, p. 193.
Wright, R. F.: Brit. Jour. Ophth., 1935, xix., 341.
Zirm, E.: Arch. f. Ophth., 1906, lxiv., 580.

as with the seminal vesicles, the degree of response is roughly proportional to the number of units administered. The muscle cells and nuclei are more swollen than is normal, and mitoses are frequent in the stroma, which is also unusually vascular.

The prostatic glands, especially in those specimens which had been injected with androstanediol, are much larger than normal. The increase in their size can be attributed mainly to an increase in the size of the cells of the glandular epithelium. These cells, especially in the best developed glands, are much larger and more regularly columnar than in the normal, with oval basal nuclei and a conspicuous inner zone of cytoplasm. The cells do not characteristically show a central paler zone in the inner cytoplasm such as is described in the rat after treatment with male hormone,[6] but this may be due to the fact that no special technique was followed in the staining of the sections, which were treated with Meyer's hæmalum and eosin. Although the glands are more open than in the controls, and contain more secretion, they are not in any specimen as dilated as in fully mature male primates. Moreover, although there are numerous mitoses in the glandular epithelium, it is doubtful whether the number of individual glands is greater than in the control material (Fig. 2).

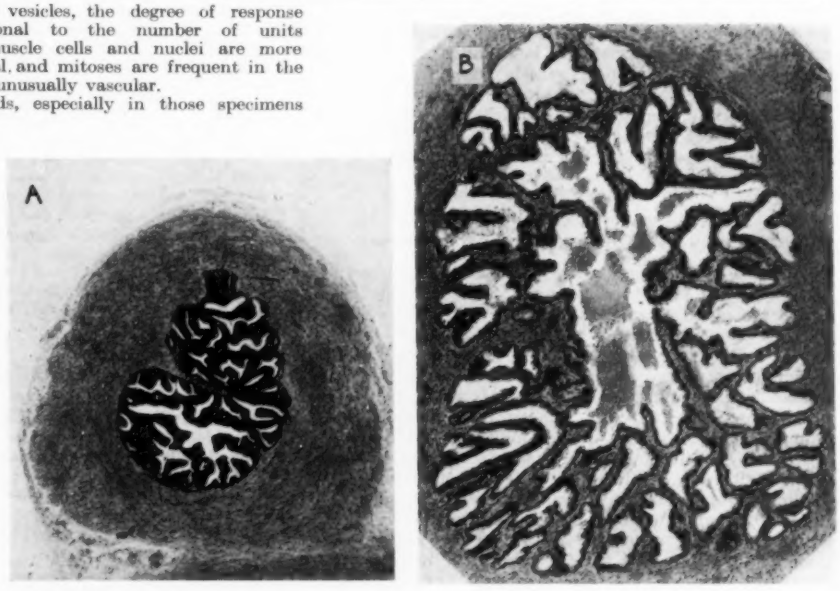

FIG. 1.—(A) Seminal vesicle of immature normal rhesus monkey (MM. 11). (B) Seminal vesicle of immature rhesus monkey (MM. 53) after injection of androstanediol (see Table I.). (× 47.)

In none of the experimental animals are there any changes in the utricular epithelium, epithelium of the terminal parts of the common ejaculatory ducts, or epithelium of the dorsal part of the lower half of the prostatic urethra, tissues which respond to œstrone.

CONCLUSION

The essential changes occasioned by male hormone in the seminal vesicles and the prostate of the immature monkey are similar to those which occur in the true prostatic tissue of rodents—i.e., the hormone promotes rapid growth in the size of the organs by acting both on their fibromuscular stroma and on their individual glandular elements, which are rapidly transformed to a mature type. In its lack of influence on the epithelium of the uterus masculinus, which responds to œstrone, male hormone obeys the principle laid down by Moore and Price [7] that "gonad hormones stimulate homologous reproductive accessories, but are without effect upon heterologous accessories"

The small number of specimens studied and the difference in the treatment of the various animals make it difficult to compare the relative potencies of the various preparations used, but the maturest

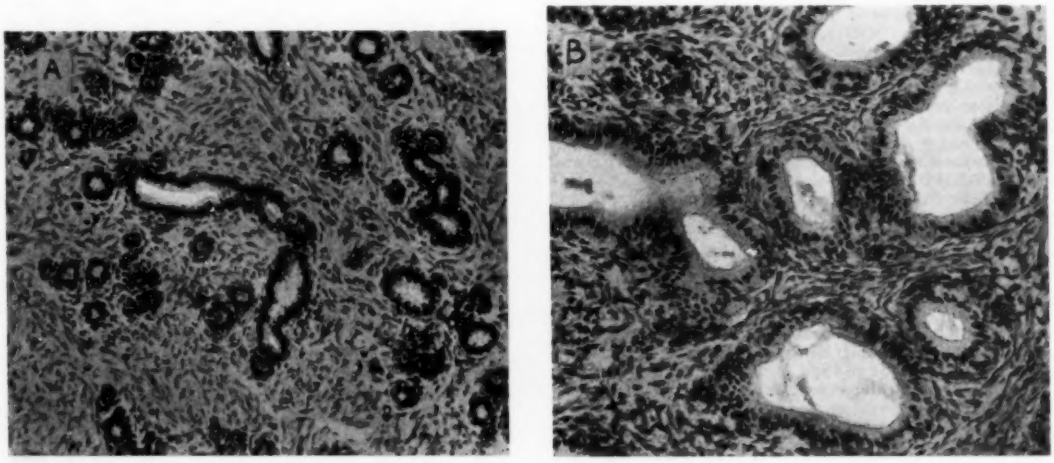

FIG. 2.—(A) and (B) prostates corresponding to seminal vesicles in Fig. 1. (× 157.)

prostates were those of the animals injected with androstanediol. The animal injected with enarmon, on the other hand, showed very few changes. Although the activity of enarmon on rats per capon unit is at least three times that of crystalline androsterone, the lack of effect in the present instance is not surprising, since the total amount of enarmon injected could not have equalled in potency much more than 30 mg. of androsterone.[8]

II.—Suppression of Effects of Œstrone by Simultaneous Administration of Male Hormone

The possibility that the epithelial changes induced by œstrone in the prostate of monkeys [9] may throw light on the ætiology of glandular hyperplasia of the prostate in man makes it urgent to inquire whether or not these changes in the monkey can be inhibited by male hormone, in the same way as similarly induced changes in the prostate of mice.[10-12] The immediate importance of this problem lies in the homological similarities of the monkey and human prostates, and in the present uncertainties as to the true relationship of the organ called prostate in mice to the primate organ of the same name. The general significance of the problem is complicated by the doubt as to the nature of the œstrogenic substance found in the male mammal. Esterified œstrone is certainly excreted by the stallion, but whether or not it is by other male mammals is unknown. Biological examination of testis extracts[13] suggests strongly that the œstrogenic substance elaborated by the bull is neither œstrone nor œstriol. Moreover, one of the two compounds possessing male hormone activity which have been isolated from human male urine (trans-dehydroandrosterone) is œstrogenic (Butenandt [14]), and the œstrogenic property of human male urine may be partly or wholly accounted for by its presence. Whether or not trans-dehydroandrosterone can produce prostatic effects in the male primate similar to those of œstrone remains to be seen. Our first experiment has proved negative (MM. 80).

The present investigation deals with a group of monkeys in three of which the effects of œstrone were undoubtedly inhibited by means of male hormone.

INVESTIGATION

Material.—Five immature male rhesus monkeys, whose weight and approximate age are given in Table II., were used. Two received an oil solution of "synthetic" androsterone as well as an oil solution of crystalline œstrone. The remaining three animals received an oil solution of androstanediol (di-hydroandrosterone) which is three or four times more potent on castrated rats than androsterone, in addition to the œstrone. These two male hormone compounds were available through the courtesy of Prof. Ruzicka and Messrs. Ciba Ltd.

Injections were made once daily for the periods indicated in Table II., and autopsies were made on the day after the last injection. Preparations from normal male rhesus monkeys and from male monkeys injected with similar amounts of œstrone alone and with similar amounts of male hormone alone were available as controls.

EXPERIMENTAL RESULTS

External changes.—Only MM. 55 presented any clear evidence that the external effects of œstrone had been suppressed by the male hormone. The other four animals all showed marked œdema of the scrotum and anus, as well as swelling and coloration of the surrounding skin. In MM. 55 the swelling was practically restricted to the anus, and in view of the internal condition (see below) there seems little doubt that the androstanediol with which this animal was injected had in some way prevented the œstrone from producing its usual external effect.

Prostatic and urethral changes.—The prostate, uterus masculinus, and upper urethra in MM. 32 and MM. 33 are not different histologically from corresponding tissues taken from animals injected with œstrone alone. In both cases the prostate is much larger than in normal animals of the same age, and there is considerable stratification of the utricular epithelium. The general prostatic stroma appears to be relatively increased in amount, and the prostatic glands in no way resemble the glands of monkeys injected with male hormone alone. The urethra also shows the typical stratification induced by œstrone.

MM. 55, MM. 57, and MM. 74, on the other hand, show the characteristic prostatic changes associated with the administration of male hormone alone, and do not present any specific features which could be ascribed to the action of œstrone. Thus the uterus masculinus in all three is normal in appearance, its epithelium varying between one and three cells deep (Fig. 3). Similarly, the urethral epithelium is normal and completely unlike the heavily stratified epithelium found in the urethra following the injection of œstrone alone.

On the other hand, the prostatic glands are much more conspicuous than those of normal animals of the same age. The individual glands are larger and more distended, and characteristically lined by regularly set large columnar cells with basal nuclei. Mitotic figures are numerous, both in the glandular tissue and in the fibromuscular stroma. As with most male monkeys injected with œstrone and male hormone, either separately or together, the prostate is much bigger in these three animals than in normal controls of the same weight and age. The prostate of MM. 74 is almost twice as large as that of a control animal slightly heavier than itself.

TABLE II

Simultaneous Administration of Male Hormone and Œstrone to Immature Male Rhesus Monkeys

No. of animal (MM.).	Body-weight	Approx. age in months.	Amount of œstrone daily (γ).	Nature of male hormone.	Daily amount.	Days injected.	Condition of uterus masculinus.
	(g.)				(mg.)		
32	2700	24	200	Androsterone.	2·5	16	Extensive stratification.
33	2700	24	200	Androsterone.	2·5	16	Extensive stratification.
55	2500	24	100	Androstanediol.	5·0	14	Normal.
57	2800	25	100	Androstanediol.	5·0	14	Normal.
74	2580	28	100	Androstanediol.	5·0	14	Normal.

DISCUSSION

The absence in MM. 55, MM. 57, and MM. 74 of any of the characteristic prostatic epithelial changes induced by œstrone can leave little doubt that androstanediol in the proportions given (50 parts by weight to 1 part by weight of œstrone) is able to inhibit the prostatic effects of œstrone. Although it is well known, as we have already noted, that androstanediol is a more potent form of male hormone than androsterone, our experiments do not permit the conclusion that it is more potent in suppressing the effects of œstrone, since we employed relatively four times as much androstanediol as androsterone per unit of œstrone. It is also uncertain whether androstanediol has a specific effect in suppressing the changes induced by œstrone. Probably other compounds of the androsterone-testosterone series would have the same effect if given in adequate amounts. There is also some indication that progesterone may have a similar antagonistic effect (see below). The actual mechanism by which œstrone is prevented from exercising its normal effects by androstanediol is a matter for conjecture, and it is of interest that the hormone did not suppress all the effects of

œstrone in our experiments. Animals MM. 57 and MM. 74 showed prominent external changes, and this implies that the œstrone threshold of the skin of the scrotum and of the surrounding parts of the rhesus monkey is lower than that of the prostate. It may, however, be noted that the seminal vesicles of the present experimental group of monkeys roughly corresponded, from the point of view of suppression of œstrone effects, to the prostates.

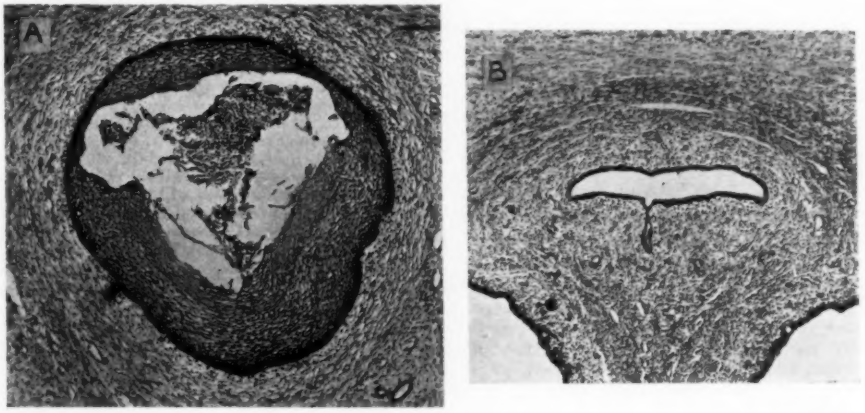

FIG. 3.—(A) Uterus masculinus of rhesus monkey (MM. 77) receiving 100 γ œstrone daily for 14 days. (× 47.) (B) Uterus masculinus of rhesus monkey (MM. 55) receiving 100 γ œstrone plus 5 mg. androstanediol daily for 14 days. (× 47.)

Our data do not allow any clear inference as to any possible synergistic action of œstrone and male hormone. In those cases in which the effects of œstrone were dominant (MM. 32 and MM. 33) there were no changes which could be clearly ascribed to male hormone, and the reverse also holds (MM. 55, MM. 57, and MM. 74). The only effect common to both groups of animals in our present experiments is the increase in the size of the prostate itself and in the amount of fibromuscular stroma, and this is an effect also obtained when either œstrone or male hormone is given separately. In failing to demonstrate a synergistic relation between œstrone and male hormone, our findings are in harmony with those of Moore [6] and Callow and Deanesly [8] on the seminal vesicles and prostate of rats, but in some disagreement with observations made by Freud,[15] Korenchevsky and Dennison,[16] and Overholser and Nelson.[17]

Male hormone is not only able to inhibit the prostatic effects of œstrone when injected simultaneously with the latter; as the following experiment shows, it can also cause the disappearance of already established prostatic changes induced by œstrone, even in spite of the latter's continued administration.

Two immature rhesus monkeys, MM. 81 and MM. 82, both 3 kg. in weight and about 2½ years old, were injected with 100 γ of œstrone daily for 67 days. From the 29th day of the experiment, by which time the prostatic changes induced by œstrone would have been well established, until the end of the experiment 39 days later, MM. 81 was given, in addition to the œstrone, 5 mg. of androstanediol daily. The first effect of this additional treatment was the diminution of the swelling and coloration in the circumgenital and circumanal skin, which was very pronounced in both animals after the first 28 days of œstrone. As the experiment proceeded these external changes became less and less conspicuous in MM. 81, and at the close the scrotum and surrounding skin were almost normal in appearance. On the other hand, the external response became more and more extensive in MM. 82, which was on œstrone alone.

The prostates of the two animals showed corresponding differences. That of the monkey which had received only œstrone showed very advanced changes induced by this treatment.[9] For example, the uterus masculinus had grown enormously, and its wall had become excessively thick. In contrast to this, the prostate of the animal which had been given male hormone as well was manifestly healthy, and provided an excellent picture of the effect male hormone has on the prostatic glands of the immature monkey. Practically no sign remained of the changes which must have been produced during the first 28 days of the experiment when œstrone alone was administered, nor was there any evidence that the œstrone injected during the last 39 days had had any effect. Except at its blind tip and at its mouth, where the epithelium was slightly deeper than normal, the uterus masculinus was no different from that of an uninjected animal. The urethral epithelium, too, though still

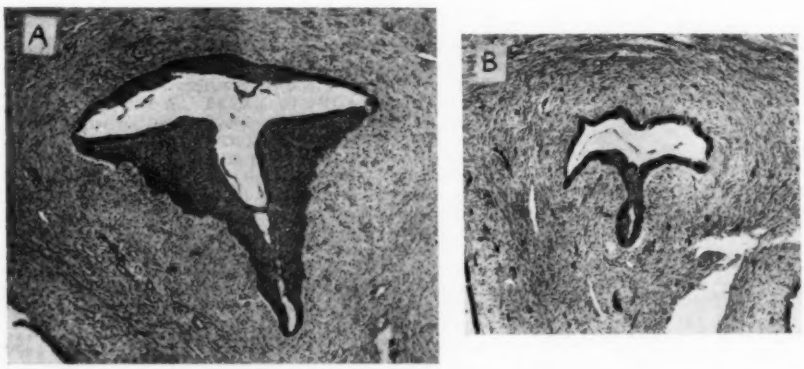

FIG. 4.—(A) Uterus masculinus of rhesus monkey (MM. 49) receiving 50 γ œstrone plus 300 γ progesterone daily for 14 days. (× 47.) (B) Uterus masculinus of rhesus monkey (MM. 65) receiving 50 γ œstrone plus 1 mg. progesterone daily for 14 days. (× 47.)

thicker than in control specimens, and though still in a few places shedding some superficial cells, gave clear evidence of being in process of returning to normal in the presence over most of its extent of a re-formed, characteristically normal, inner cellular layer.

If, as has been suggested, benign glandular hyperplasia of the prostate is due to the excessive activity of some œstrogenic substance, this experiment suggests a possible means of treatment for the condition.

III.—Simultaneous Administration of Œstrone and Progesterone

Recent investigations, stimulated largely by earlier observations on the inhibitory effect exercised by the corpus luteum on the occurrence of œstrus, suggest that the effects of œstrin can be suppressed by the simultaneous administration of progestin.† Thus, Smith and Smith [18] report that in rabbits the injection of progestin leads to the more rapid excretion of injected œstrin, and they relate this finding to their further observation [19] that œstrin is excreted by women only when a corpus luteum is present in an ovary. Although their former finding has failed to receive corroboration at the hands of Frank and his co-workers,[20] the general thesis advanced by Smith and Smith is well supported in the recent finding of Allen and Meyer,[21] that the cornifying effects of œstrin on the rat's vagina can be completely suppressed by the simultaneous administration of progestin.

In view of these several observations it seemed worth while to inquire whether or not the injection of progesterone could inhibit the epithelial hyperplasia induced by œstrone in the uterus masculinus and urethra of rhesus monkeys (see Parkes and Zuckerman [9]). We have pointed out above and elsewhere [22 23] the importance of effecting such an inhibition, and although the series of experiments reported here was a failure from this point of view, they provide data which are of value in estimating the quantitative relations of the two ovarian hormones.

INVESTIGATION

Material.—Only immature rhesus monkeys (*M. mulatta*) were used in the present study. They are listed, with all relevant data, in Table III. The progesterone used was prepared by Dr. R. K. Callow from pregnandiol [24] provided by Dr. G. F. Marrian, to both of whom we are deeply indebted. A sample of the preparation (σ form) in oil solution was tested by Dr. M. K. McPhail, who found that 0·6 mg.–0·7 mg. was equivalent to the rabbit unit of his definition.[25] One animal, MM. 21, was injected with an oil solution of progestin (B.D.H.) prepared from fresh corpora lutea.

The monkeys were injected once daily and autopsies were performed on the day following the last injection.

EXPERIMENTAL RESULTS

External changes.—Qualitative estimations of the degree of cutaneous and subcutaneous swelling occasioned in the scrotum and surrounding tissues by the injections are indicated in Table III. by the numerals 0–5, 5 representing the maximum swelling which we have observed in control animals receiving corresponding amounts of œstrone alone. The grading was based on the degree of external swelling and coloration shown during, and at the end of, the period of injection.

The degree of swelling caused by a given amount of œstrone varies considerably, and it is therefore impossible to decide whether or not the external response was inhibited by progesterone treatment.

Prostatic and urethral changes.—The essential changes occasioned by œstrone in the prostate of the rhesus monkey are fibromuscular growth of the stroma of the whole gland, and epithelial stratification and distension of the uterus masculinus. In addition to these changes, considerable epithelial growth may occur in the lower part of the prostatic urethra, especially dorsally on the crista urethralis and even in the membranous and penile portions of the urethra.

With the exception of three, MM. 21, 70, and 72, which are considered below, all the animals in the present experimental series showed characteristic œstrone-produced prostatic and urethral changes in spite of the fact that progesterone had been simultaneously injected. The extent of these changes have been estimated and indicated in Table III. by the numerals 0–5, 5 representing the maximum amount of change observed in control animals receiving corresponding amounts of œstrone alone.

As in the case of the external response, the degree of change induced by œstrone alone in the prostate of monkeys varies from animal to animal. Except in the group MM. 46, 49, 47, 63, 64, and 65, all of whom received 0·05 mg. of œstrone daily with varying amounts of progesterone, there is no evidence of any regular suppression of œstrone effects. It is significant from the point of view of individual variation that MM. 51, which received

TABLE III

Simultaneous Administration of Œstrone and Progesterone to Immature Male Rhesus Monkeys

No. (MM.)	Weight.	Approx. age in months.	Days injected.	Œstrone injected daily.	Progesterone injected daily.	Œstrone changes in prostate and urethra (Deg. 0–5)	External scrotal &c. response (Deg. 0–5)
	(g.)			(mg.)	(mg.)		
21	2420	22	6	5·00	1·40*	0	No obser.
37	1830	20	14	0·20	0·20	5	3
38	1575	20	14	0·20	0·20	2	3
40†	1600	20	28	0·20	0·20 ‡ 0·40 ‡	5	1
41	3150	34	14	0·20	0·50	2	4
50	2200	20	14	0·20	0·50	1	3
51	3800	34	14	0·20	0·50	5	4
45	2700	24	14	0·10	0·20	5	1
46	2690	30	14	0·05	0·20	3–4	1
49	4275	49	14	0·05	0·30	4–5	5
47	2711	24	14	0·05	0·40	5	1
63	4250	42	14	0·05	0·50	2	4
64	3550	35	14	0·05	0·75	2	0
65	4020	39	14	0·05	1·00	1–2	4
70	4560	48	14	—	0·50	0	0
72	3220	37	14	—	0·30	0	0

* Approximate. Two rabbit units of B.D.H. progestin injected daily.
† The daily dose of progesterone was doubled on the 15th day.
‡ × 14 days. No obser. = No observation.

precisely the same treatment as MM. 50, nevertheless showed considerably more marked prostatic changes; its external cutaneous response was, however, only slightly more pronounced.

There is some evidence in the six monkeys which received 50 γ of œstrone daily, that œstrone effects were suppressed in those that were given the greater amounts of progesterone. The gradient of effect is particularly well shown in the uterus masculinus, which was much more heavily stratified in MM. 46, 49, and 47, than in MM. 63, 64, and 65. The moderate epithelial growth that had occurred in the latter three animals had not proceeded far enough to disturb the original inner lining layer of utricular cells, which was still mostly intact. This layer always disappears in animals which show a marked utricular response (Fig. 4).

The prostates of the two monkeys MM. 70 and 72, which were injected with progesterone alone, presented no histological character that distinguished them from the normal. There was also no change in MM. 21, but this may have been due to the short period for which the animal was injected.

DISCUSSION

Our observations show that there is no constant positive correlation between the degree of external change and the prostatic changes that occur when

† The terms *œstrone* and *progesterone* refer to pure substances of known composition and should not be applied to crude preparations.

œstrone is injected simultaneously with progesterone. For example, MM. 65 showed pronounced cutaneous changes; its prostatic changes were on the other hand very slight. This fact can be related to the finding, referred to above, that both the external and internal changes induced by œstrone, or by œstrone and progesterone given simultaneously, are very variable in extent. A uniform picture of suppression would therefore be necessary to establish that progesterone can in fact inhibit the prostatic effects of œstrone. Nevertheless, some of the results obtained, especially with the group of six monkeys which received 50 γ of œstrone daily together with increasing amounts of progesterone, do seem to point in this direction, and in view of our findings in regard to the simultaneous administration of œstrone and male hormone, there seems some reason to believe that the injection of larger amounts of progesterone than were used in the present study might inhibit the effects of œstrone. In our most favourable experiment, the proportion of progesterone to œstrone was 20 to 1. Allen and Meyer[21] found, however, that as much as 1 rabbit unit of progestin is necessary to inhibit the cornifying effect of 6 rat units of œstrin when injected over a period of six days. Weight for weight the relation of progesterone to œstrone in their experiments could not have been less than 50 to 1, and was probably much higher. In our experiments with male hormone, 50 parts by weight of androstanediol were found to be capable of inhibiting the prostatic effect of 1 part of œstrone. As soon as progesterone is more readily available than it is at present, we therefore propose to continue these experiments, using amounts of progesterone of the order that the above figures indicate. A series of experiments has also been begun in which similar proportions of inert sterols are administered to male monkeys simultaneously with œstrone.‡

Finally, it may be noted that the lack of any effect upon the prostate when progesterone alone is injected is fully in harmony with the well-known fact, established on female animals, that this hormone is ineffective unless the tissues have been previously sensitised by œstrone. It should also be noted that when given simultaneously with œstrone, progesterone does not occasion any obvious specific effects of its own upon the prostate.

Summary

I.—Androsterone and androstanediol produce rapid development of the prostate and seminal vesicles of immature rhesus monkeys. The histological changes are similar to the corresponding ones in rodents.

II.—Androstanediol suppresses the prostatic effects of œstrone in monkeys when administered in the proportion of 50 to 1.

III.—Progesterone does not inhibit the prostatic effects of œstrone in the amounts tested.

Part of the expenses of this work was defrayed by a grant to S. Z. from the Medical Research Council.

REFERENCES

1. Antonius, O.: Zool. Gart. (Leipzig), 1930, ii., 134.
2. Ruzicka, L., Goldberg, M. W., Meyer, J., Brüngger, H., and Eichenberger, E.: Helv. Chim. Acta, 1934, xvii., 1395.
3. Ruzicka, Goldberg, and Meyer: Ibid., 1935, xviii., 210.
4. Moore, C. R., Hughes, W., and Gallagher, T. F.: Amer. Jour. Anat., 1930, xlv., 109.
5. Callow, R. K., and Deanesly, R.: THE LANCET, 1935, ii., 77.
6. Moore, C. R.: In Sex and Internal Secretions, edited by Edgar Allen, Baltimore, 1932.
7. Moore, C. R., and Price, D.: Amer. Jour. Anat., 1932, l., 13.

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‡ In the only two experiments so far completed (MM. 84 and MM. 86) it was found that the utricular effects of œstrone were suppressed by the simultaneous administration of cholesterol.

EXPERIMENTAL PRODUCTION BY ŒSTRIN OF PITUITARY TUMOURS WITH HYPOPITUITARISM AND OF MAMMARY CANCER

BY W. CRAMER, Ph.D. Berlin, D.Sc. Edin., M.R.C.S. Eng.
AND
E. S. HORNING, D.Sc.
BEIT MEMORIAL FELLOW
From the Imperial Cancer Research Fund, London

(WITH ILLUSTRATIVE PLATE)

THE following observations were made in the course of experiments in which mice were subjected to the prolonged influence of œstrin administered by painting the skin twice weekly with a 0·01 per cent. solution of œstrin in chloroform. The experiments were carried out mainly with a preparation called α-folliculin, generously placed at our disposal by Messrs. Schering. Experiments were also carried out with a preparation of keto-hydroxy-œstrin obtained commercially from a different source. The œstrin was applied to male and female mice, both normal and castrated, and two different strains of mice were used: one a mixed strain with a low incidence of spontaneous mammary tumours, and another a specially inbred strain with a very high incidence (about 70 per cent.) of spontaneous mammary tumours. This high cancer strain—the "D.Z. strain"—had been bred from one male and two females which had been kindly sent to us by Madame Dobrowadskaia-Zawadskaia two years ago, and which belonged to the strain labelled by her R.III. This strain has continued to breed well in our laboratories and to yield a high percentage of mammary tumours in females more than six months old. Multiple mammary tumours appear not infrequently in these animals. The males of this strain never develop mammary cancer spontaneously.

As a result of painting the skin with œstrin all the 5 males of the high cancer strain which had been subjected to the treatment for a sufficiently long period developed mammary cancer, 2 of them with tumours in both right and left axilla. The first tumour appeared after 16 weeks, the last tumour after 21 weeks, of œstrin painting. One of the tumours had a metastasis in the lung. Another tumour has been transplanted through three genera-

(*Continued from previous column*)

8. Callow and Deanesly: Biochem. Jour., 1935, xxix., 1424.
9. Parkes, A. S., and Zuckerman, S.: THE LANCET, 1935, i., 925.
10. Laqueur, E.: Schweiz. med. Woch., 1934, lxiv., 1116.
11. De Jongh, S. E.: Acta Brev. Neerl., 1935, v., 28.
12. Same author: Arch. internat. de pharm. et de thérap., 1935, l., 348.
13. Dorfman, R. I., Gallagher, T. F., and Koch, F. C.: Endocrinology, 1935, xix., 33.
14. Butenandt, A., and Kudszus, H.: Zeits. f. physiol. Chem., 1935, ccxxxvii., 75.
15. Freud, J.: Biochem. Jour., 1933, xxvii., 1438.
16. Korenchevsky, V., and Dennison, M.: Ibid., 1934, xxviii., 1486.
17. Overholsen, M. D., and Nelson, W. O.: Anat. Rec., 1935, lxii., 247.
18. Smith, G. van S., and Smith, O. W.: Amer. Jour. Physiol., 1931, xcviii., 578.
19. Same authors: Ibid., 1932, c., 553.
20. Frank, R. T., Goldberger, M. A., and Spielman, F.: Proc. Soc. Exp. Biol., 1932, xxix., 1229.
21. Allen, W. M., and Meyer, R. K.: Anat. Rec., 1935, lxi., 427.
22. Zuckerman and Parkes: Jour. of Anat., 1935, lxix., 484.
23. Same authors: Jour. of Anat. (In the press.)
24. Butenandt, A.: Ber. d. Deut. chem. Ges., 1934, lxvii. (B), 1901.
25. McPhail, M. K.: Jour. of Physiol., 1934, lxxxiii., 145.

tions so far. A sixth tumour was found in a castrated male mouse of this strain which had been painted with keto-hydroxy-œstrin for 19 weeks. An apparently paradoxical result is that none of the females of this strain developed a tumour after treatment with œstrin lasting for more than 6 months, although tumours appear in 60–70 per cent. of untreated females of this strain when they are over six months old. Of the mixed strain, neither the males nor the females have so far developed a tumour.

The results confirm the observations of Lacassagne,[1] who first demonstrated the appearance of mammary carcinoma in male mice by injections of œstrin. While these experiments were in progress, Burrows [2] has also recorded the development of mammary cancer in 2 male castrated mice out of 20 mice of a mixed strain, after painting the skin with œstrin for a period of 25 weeks and 41 weeks respectively. No tumour had appeared in 110 male non-castrated mice of the same strain, which showed a very low incidence of spontaneous mammary tumours in the female. In our experiment, the œstrin-painted mice showed the extensive changes in the uterus and vagina in the females and the atrophy of the testicles in the males which have been described previously. Scrotal hernia was observed to occur only in the males of the high cancer strain. The histological examination of the testis disclosed a condition which does not appear to have been described previously: œstrin inhibits the formation of spermatids and of spermatozoa and at the same time arrests division in the primary and secondary spermatocytes, the great majority of which present themselves in the process of cell division (Fig. 5). Œstrin therefore appears to arrest the process of cell division in the testis.

These results will be described in greater detail in a separate publication. For the present we wish merely to emphasise the following conclusions as being of general significance:—

1. Œstrin is absorbed by the unbroken skin without producing in it any carcinogenic effect.

2. Unlike the other carcinogenic substances so far studied experimentally, the carcinogenic effect of œstrin is restricted to a tissue remote from the site of application of the carcinogenic agent, but possessing a specific physiological sensitiveness to it. The action of œstrin resembles that of the other carcinogenic agents in producing first a hyperplasia of the tissue in which the cancer subsequently develops—the precancerous condition—and in the long period of time necessary to induce cancer.

3. The striking difference between the carcinogenic response to œstrin of male mice belonging to two different strains demonstrates clearly the importance of the factor "susceptibility," which in this case is genetic in origin, in the ætiology of cancer. The fact that cancer develops here in a site in which it never appears spontaneously demonstrates equally clearly the importance of the extrinsic carcinogenic factor, in this case œstrin.

4. The sensitiveness of the male mamma in its carcinogenic response to œstrin, contrasted with the great insensitiveness to œstrin of the female mamma in animals of a pure strain in which the female mamma develops cancer spontaneously in a very high percentage, suggests that either the female organism is able to destroy effectively the excess of œstrin administered experimentally, or that the carcinogenic response of the mammary epithelium depends on an indirect and not on a direct interaction between œstrin and the cells.

The second object of this communication is to record the occurrence of changes after the prolonged administration of œstrin which extend beyond the sex organs and which have not been recognised previously. It was found that an outstanding change in mice treated with œstrin over a prolonged period was the complete disappearance of fat, in fact a condition of cachexia. There were also extensive degenerative changes in the adrenal (Fig. 6), with active secretion of adrenaline by the medulla, and a hypertrophy in the islets of Langerhans. These effects will be described in greater detail in subsequent publications.

The spleen was sometimes reduced to a thin red ribbon, and the thymus was atrophied. The changes in the testis have been mentioned above. These changes suggested a general effect of œstrin, and further search led us to a systematic examination of the pituitary. During this experiment we have so far examined the pituitary gland of 12 mice treated with œstrin over a prolonged period. Of these, only 1 gland was normal to the naked eye, 8 were macroscopically enlarged without an alteration in the general shape of the organ and without gross pathological lesions in the gland, and 3 were definite adenomatous tumours, nodular, round, deeply congested and hæmorrhagic, and from five to ten times the size of the normal gland, so that the tumour extended over the optic nerves and in one case (No. 217) compressed them, producing degenerative changes in the nerve (Fig. 2). Even with the naked eye it could be seen that the changes affected mainly, if not entirely, the anterior part of the gland. The experimental details concerning the three animals in which these tumours were found are given in the following Table:—

Ref. No.	Strain.	Sex.	Treatment with œstrin.	Preparation.	Condition of mamma.
202	D.Z.	Male.	25 weeks.	α-folliculin.	Mamma carcinoma.
215	Mixed.	Male, castrated.	44 ,,	,,	Mamma well developed but no carcinoma.
217	D.Z.	,,	19 ,,	Keto-hydroxy-œstrin.	Mamma carcinoma.

[1] Lacassagne, A.: Compt. rend. Soc. de Biol., 1932, cxcv., 630.
[2] Burrows, H.: Amer. Jour. of Cancer, 1935, xxiv., 613.

EXPLANATION OF PLATE

FIG. 1.—Naked-eye view of pituitary gland of normal male mouse, showing size and relation of gland to the optic nerves.

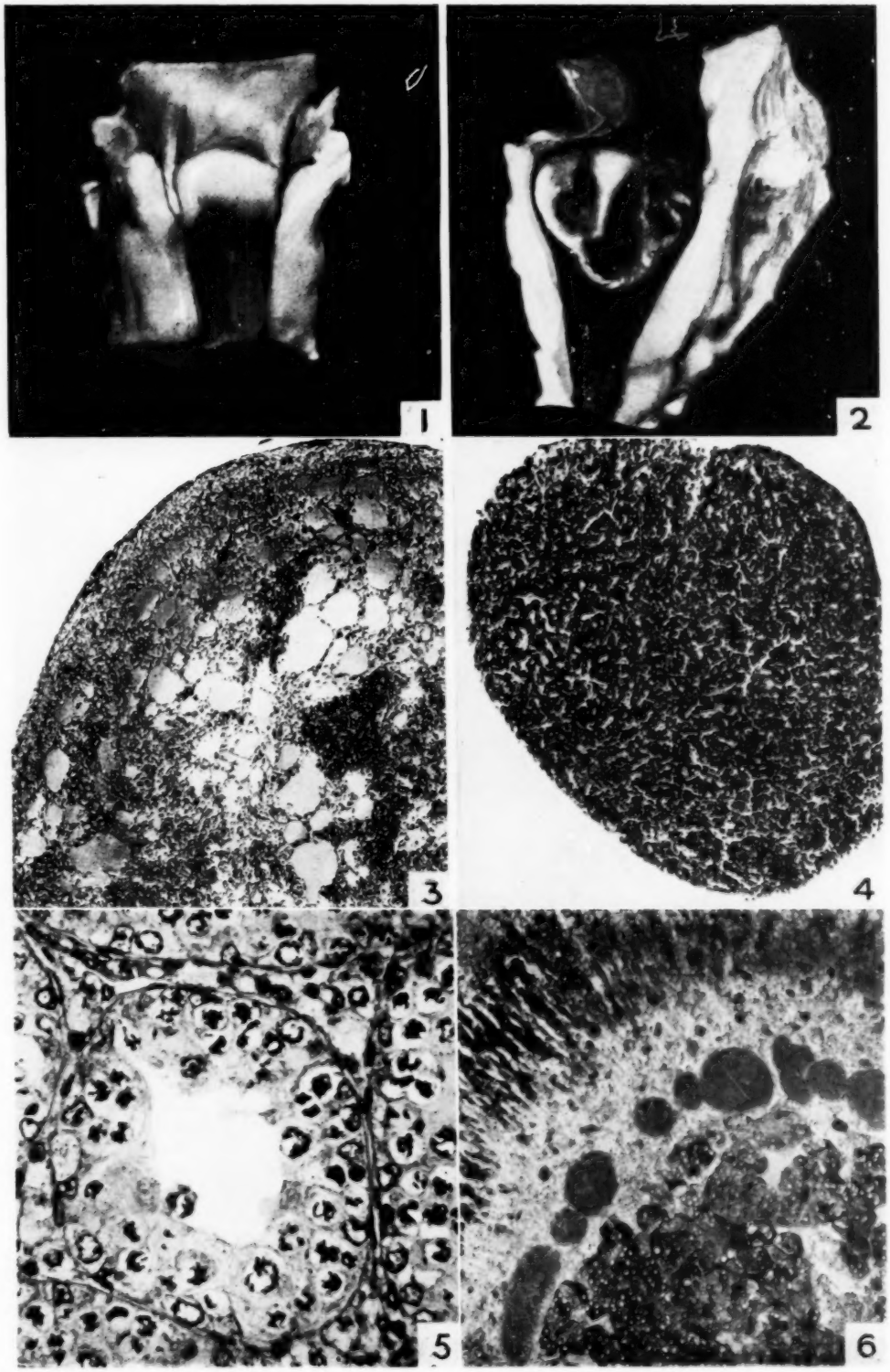
FIG. 2.—Naked-eye view of pituitary gland of male mouse of D.Z. strain after 6 months' painting with œstrin (Ref. No. 202 in Table of text), showing intense congestion of the pars anterior and compression of optic nerve.

FIG. 3.—Section through anterior lobe of gland illustrated in Fig. 2, showing large hæmorrhagic areas.

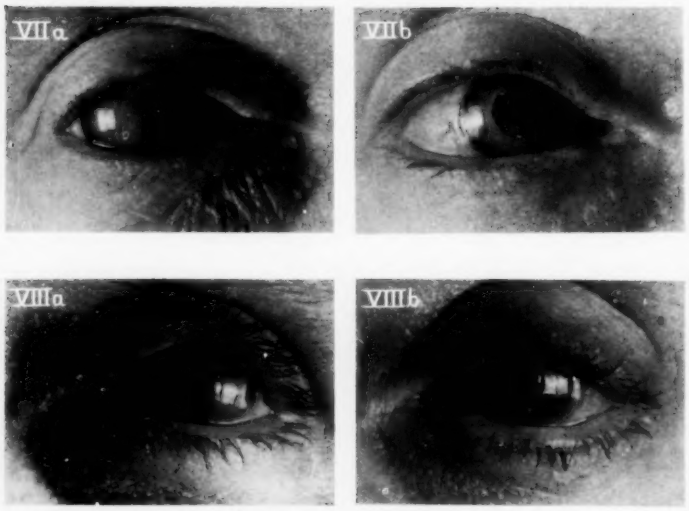
FIG. 4.—Section through anterior lobe of normal mouse pituitary at a magnification slightly higher than in Fig. 3, to illustrate degree of enlargement of the adenoma.

FIG. 5.—Section through testis of a mouse after 6 months' application of œstrin, showing absence of spermatids and spermatozoa, and arrest of the process of cell division, so that practically all the cells are immobilised in mitosis.

FIG. 6.—Adrenal gland of a male mouse after 5 months' application of œstrin. Osmic vapour fixation. Round masses of degenerating cells are conspicuous around the medulla. In a more advanced stage they almost completely replace the medulla. There is active secretion of adrenaline in the medulla.

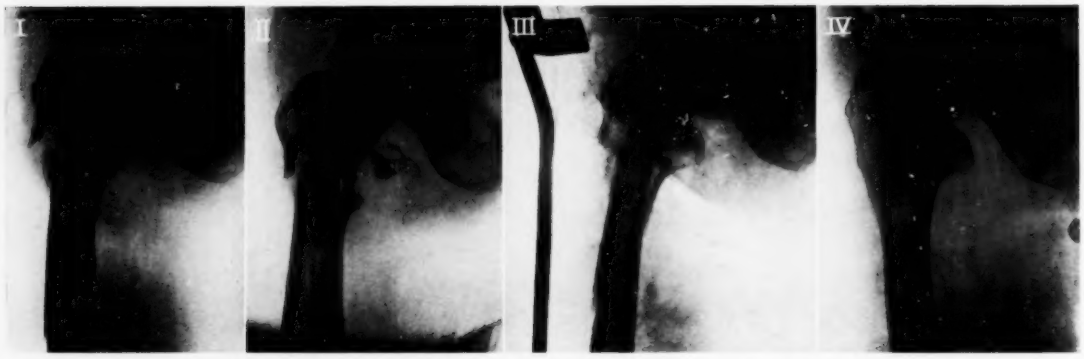


DRS. CRAMER AND HORNING: EXPERIMENTAL PRODUCTION OF PITUITARY TUMOURS AND OF MAMMARY CANCER BY PAINTING THE SKIN WITH ŒSTRIN

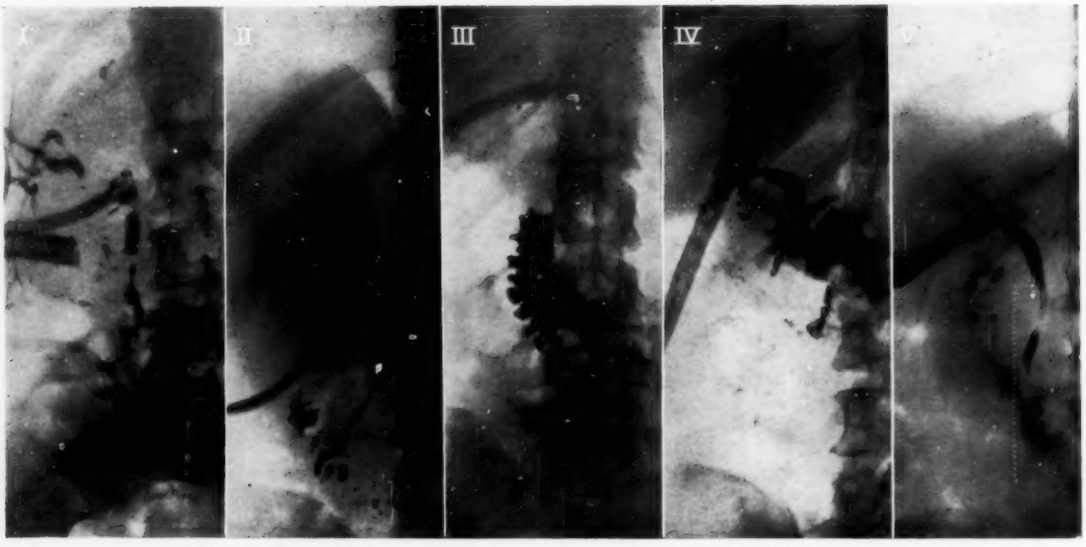


MR. RYCROFT: CORNEAL GRAFTS

MR. HOSFORD: KÜMMELL'S DISEASE



MR. MONTEITH: BEDSIDE RADIOGRAPHY FOR A FRACTURE



MR. COSBIE ROSS: LIPIODOL IN SURGERY OF BILIARY PASSAGES

The pituitary tumours were found, therefore, in mice of both strains and in mice with and without the presence of a mammary cancer.

The detailed histological examination of the pituitaries has not yet been completed, but a preliminary microscopic examination of the three adenomata has shown extensive hæmorrhages and congestion, confined almost entirely to the pars anterior and disorganising it (Fig. 3). There was also an excessive number of the chromophobe type of cell, so that the condition may be described as a hæmorrhagic chromophobe adenoma of the anterior part. This was associated with a general condition of the animals, which is generally taken to be hypopituitarism. In man also chromophobe adenomas are known to produce a state of hypopituitarism.[3] The condition produced by us experimentally resembles in many respects the syndrome of a disease in man known as Simmonds' disease. This disease, which is found more frequently in women than in men and is said often to follow parturition,[4] is associated with an extensive destruction of the anterior part of the pituitary.

According to the prevailing conception, the pituitary presides over the whole endocrine apparatus, and it is therefore probable that the changes observed by us in the other endocrine organs are secondary to the changes in the pituitary. But if the pituitary presides, its position is not that of a dictator but rather of a *primus inter pares*. For as our experiments show, it is itself susceptible to hormonal influences coming from another part of the endocrine apparatus. Since in these experiments the changes in the pituitary and the development of malignancy in the mammary gland are both produced by œstrin it is reasonable to suspect that the two may be ætiologically related. Further investigations are necessary to determine how the chain of events is linked together.

As this paper is a preliminary communication we have restricted ourselves to statements on new and outstanding changes which we believe to have established on a sufficiently large material, and we have refrained from mentioning observations which will have to be repeated and checked by further experiments. Since œstrin preparations are now being used extensively in gynæcological practice it may be well to point out that the carcinogenic changes here described were produced by the administration of œstrin prolonged over a period representing a considerable fraction of the normal span of life of a mouse and corresponding in man to a period of from 7 to 10 years, while the therapeutic administration of œstrin preparations in man is, in skilled hands, limited to short periods of a few weeks or months. The development of mammary cancer described in this paper should not, therefore, be used as an argument against the therapeutic application of œstrin preparations. The discovery that the sphere of action of œstrin preparations extends beyond the generative organs and embraces the whole endocrine apparatus is likely to enhance greatly their therapeutic importance.

[3] Cushing, Harvey: The Pituitary Body, &c., Baltimore, 1932, p. 15.
[4] Graubner, W.: Zeits. f. klin. Medizin., 1925, c., 249.

KÜMMELL'S DISEASE

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(WITH ILLUSTRATION ON PLATE)

In 1894 Kümmell gave an account of six cases of a condition of the spine which he said had not previously been described. Actually Verneuil had described it in 1892. Since that date Kümmell has published several more papers on the subject and other writers have reported many cases. The condition has come to be known as Kümmell's disease (Kümmellsche Krankheit).

Kümmell divided the course into three stages, but Cardis, Walker, and Olver have described five stages. Briefly they are:—

1. History of an *injury*.—This may be quite slight, or severe enough to keep the patient in bed. The injury is not usually directly to the spine but affects it indirectly by sudden forced flexion, as, for example, a doubling-up injury when a mine shaft collapses on a man, or a fall on to the buttocks from a height causes a sudden jar to the spine.

2. *Post-traumatic period*.—This also is very variable. There may be no symptoms. On the other hand, there may be local pain in the back and rarely even paraplegia is seen.

3. *Latent period*.—During this stage there are no symptoms. Any pain or paraplegia has disappeared

EXPLANATION OF PLATE

MR. RYCROFT

Fig. VII. (Case 1).—Before operation (left) the right cornea is completely grey and opaque. The graft (right) is not bevelled and its appearance should be compared with that of the bevelled graft shown in Fig. VIII.

Fig. VIII. (Case 3).—The condition of the only eye. The vacant staring appearance contrasts with that after operation shown on the right.

MR. MONTEITH

Fig. I.—Fracture: paratrochanteric and of shaft and lesser trochanter.

Fig. II.—Protraction, abduction, and flexion: detachment of lesser trochanter.

Fig. III.—Metal stay incorporated, maintaining abduction and flexion without protraction: reposition of lesser trochanter.

Fig. IV.—State of femur seven months after injury.

MR. HOSFORD

Compression fracture of ninth dorsal vertebra in case, clinically and radiographically resembling Kümmell's disease.

MR. COSBIE ROSS

Fig. I. (Case 1).—The narrower tube is the one draining the common bile-duct. The radiogram shows the lipiodol, part of which is filling the duct, and the remaining part in the duodenum.

Fig. II. (Case 2).—The common duct is outlined by a thin column of lipiodol, part of which has passed on into the duodenum. The two translucent smaller areas are due to air bubbles which entered with the lipiodol.

Fig. III. (Case 3).—This reveals the second part of the duodenum clearly outlined by lipiodol, while the common duct is barely seen.

Fig. IV. (Case 4).—In this case the whole biliary tract is outlined, there is dilatation of the common duct but free entrance to the duodenum.

Fig. V. (Case 5).—This again reveals free passage of the lipiodol into the duodenum.

It is very variable in length and may be anything from a few days to months or even years.

4. *Onset of fresh symptoms.*—These are chiefly pain in the back and a sharp kyphosis at the site of the affected vertebral body which in a skiagram is seen to have collapsed.

5. The last stage depends on the institution of proper treatment or otherwise. If treatment is neglected there is complete collapse of the affected vertebra, whereas if satisfactory treatment is carried out any collapse of the bone is prevented and there is a resolution of the pathological change.

A number of theories have been advanced from time to time to account for this post-traumatic collapse of a vertebra. It will suffice to mention a few of these.

Kümmell originally believed it to be a "rarefying osteitis" of inflammatory origin following a disturbance of nutrition of the bone. Later he took the view that there was always some damage to the bone. In two further papers in 1928 he refers to Schmörl's work on prolapse of the nucleus pulposus of the invertebral disc into the body of the vertebra, as having some bearing on Kümmell's disease.

Henle believed that the changes in the bone were due to vasomotor disturbances brought on by trauma. Mikulicz held that trauma caused intra- and extra-dural hæmatomata which, by infiltrating nerve-roots and ganglia, brought on trophic changes which caused a softening of the bone. Ludloff found rupture of vessels of the lumbar segments and considered that the subsequent changes in the bone were due to nutritional impairment.

In the last few years post-traumatic atrophy has been widely discussed, and it has been suggested that Kümmell's disease is an example of it. Watson Jones and Roberts state, "If it be accepted that Kümmell's disease of the spine . . . can occur in the absence of any fracture, it is to the hyperæmic decalcification of contusion of the vertebræ that the condition must be ascribed." King goes further and seems to believe that Kümmell's disease can occur in the absence of any fracture and is of the nature of a post-traumatic hyperæmic rarefaction.

THE RADIOGRAPHIC DIAGNOSIS

It must be obvious that in order to establish a diagnosis of Kümmell's disease in the case of a patient with kyphosis there must be available one skiagram taken soon after the injury showing an apparently normal vertebra and another at a later date showing collapse of the vertebra. It is essential to have a lateral view of the vertebra, anterior and posterior views being of little value in detection of any abnormality in the body of a vertebra. Also the skiagram must be good enough not only to show the outline of the body but also to show, at least to some extent, the internal architecture of the bone.

Without such a skiagram it is quite impossible to say whether at the time of the original injury to the spine there was a fissured fracture of a vertebral body without displacement or whether no actual damage was done to the bone. The latter must be the case in order to establish the diagnosis of Kümmell's disease.

A search for a case of Kümmell's disease in which there is a satisfactory lateral skiagram immediately after the accident is not very fruitful. Kümmell's first papers were published before the days of X rays. In some of his later papers there are reproduced two skiagrams, one showing an antero-posterior view of a man's spine taken some time after the accident, and a later view showing some collapse of a vertebra. The first antero-posterior view, however, although it is a good skiagram, is quite useless as negativing any injury to the body. Of the comparatively few cases he quotes, this is the only one of which any skiagrams are produced.

In Schultz's extensive review of the condition with reports of 21 cases no skiagrams are reproduced.

Baker in the eight cases he quoted did not see any skiagrams taken immediately after the accident nor was he able to get reports on them.

Blaine described ten cases but none of them were radiographed in the early stages.

Cardis, Walker, and Olver, in 1928, quoted 14 cases in their excellent paper on Kümmell's disease, but in only one was any reference made to an early skiagram before collapse of a vertebra, and this was not reproduced.

In 1931 Rigler reported one case, that of a woman aged 55, who had a severe injury and was in bed for seven weeks with pain and weakness in the back. About a fortnight after getting up a skiagram showed no apparent abnormalities of the seventh or ninth dorsal vertebræ, but nine months later a second skiagram showed that they were compressed. This may have been a case of Kümmell's disease without any initial fracture, but during seven weeks in bed the vertebræ had time to begin to consolidate if there was a fracture, and two weeks out of bed is little time for compression to begin to show itself distinctly.

King reported six cases. One of these is an important case because there was the opportunity for an autopsy and a very detailed examination was carried out. It was the case of a woman of 57 who had a "severe fall," and later developed a kyphosis and paraplegia. It is most unfortunate that no skiagrams were obtained at the time of the fall. No early skiagrams are reproduced in any of his six cases.

From a careful examination of the literature I have been unable to find a case of Kümmell's disease in which a good lateral skiagram taken after the initial injury shows a normal vertebra. The following case may be quoted :—

In 1929 a labourer, aged 55, fell twenty feet off a ladder and was admitted to St. Bartholomew's Hospital. He had sustained a laceration of his scalp and a fractured clavicle, and complained of pain in the lower dorsal region. No deformity was present. Skiagrams were taken twice but showed no abnormality. He walked out of hospital three weeks later. After a further week a slight angular deformity was visible in the lower dorsal region and a skiagram showed a compression fracture of the ninth dorsal vertebra (Figure on Plate).

This is not quoted as a case of Kümmell's disease but as one of a fracture of the body of the vertebra which was missed at the first examination ; it is, however, an exact parallel to many cases reported as Kümmell's disease in that (1) skiagrams taken immediately after the accident showed no deformity (but they were not really satisfactory views) ; (2) there was a latent period ; and (3) compression and deformity were seen at a later date. One cannot but believe, however, that this is anything other than a case of compression fracture of a vertebra which was not recognised by the clinician or the radiologist ; and there seems no reason to invoke any other pathology than that of fracture, nor to give it any other name.

DOES THE DISEASE EXIST ?

In 1928 Cardis, Walker, and Olver described Kümmell's disease as still struggling for recognition. There surely must be some doubt about the real existence of any condition which, over thirty years after its first description, is not fully recognised. There seems no real reason to believe that Kümmell's disease is anything other than a fracture of a

vertebral body. At the time of the original injury there are presumably one or usually more fissures through the bone. There may be little or no compression at the time: even if there is some compression it is likely to disappear when the patient lies flat in bed and so might not easily be recognised in a skiagram even if the latter were obtained. If at this stage the true state of affairs is recognised and a fracture of the body of a vertebra is diagnosed, appropriate treatment is carried out, the spine being immobilised in the fully extended position; no compression of bone is allowed to take place and the bone consolidates in its normal shape and position and the case is looked upon as a satisfactory result of a fracture of a vertebral body. On the other hand if the possibility of a fracture of a vertebra is overlooked for any reason and a kyphosis appears at a later date, no proper treatment having been carried out, it has been customary to refer to it as Kümmell's disease, and to discuss a variety of pathological changes which may have brought it about.

If we look in other parts of the body for the same changes following a fracture which has been overlooked and not properly immobilised, we see similar absorption and loss of bone substance. Typical situations where these changes are seen when efficient fixation has not been employed are in fractures of the neck of the femur, and in the common fracture of the carpal scaphoid. In this connexion it is of particular interest to find that King, a strong advocate of the theory that Kümmell's disease is due to a post-traumatic hyperæmic rarefaction, says: "The usual finding then even in the cases in which there is fracture, is an active hyperæmia."

It seems inconsistent and confusing therefore to make an exception of the vertebral bodies and give a special name to an overlooked fracture in this situation when no such deception is carried out in the case of other bones. Kümmell must be given every credit for his observations and for drawing attention to the delayed collapse of a vertebra after an injury rather than for his explanation of this delayed collapse.

Thus it would seem to be advisable to teach not that there is a condition known as Kümmell's disease of somewhat obscure pathology but that: (1) Compression fractures of the bodies of the vertebræ are easily overlooked owing to their relatively mild symptoms and absence of signs. (2) In all cases of pain in the spine following an injury skiagrams of the vertebræ should be taken and if the lateral view is not clear it should be repeated. (3) If the skiagrams show no fracture and the pain persists when the patient has got up, another lateral skiagram should be taken and the closest clinical observation kept for the onset of any kyphosis. (4) Treatment in an ambulatory plaster jacket should be instituted at the earliest sign of any injury to a vertebral body.

REFERENCES

Baker, R. H.: Surg., Gyn., and Obst., 1920, xxxi., 359.
Blaine, E. S.: Radiology, 1930, xv., 551.
Cardis, Walker, and Olver: Brit. Jour. Surg., 1928, xv., 616.
Henle, A.: Arch. f. klin. Chir., 1896, lii., 1.
Jones, R. W., and Roberts, R. E.: Brit. Jour. Surg., 1933, xxi., 461.
King, E. S. J.: Localized Rarefying Conditions of Bone, London, 1935.
Kümmell, H.: Aerztl. Sachverst. Zeitung, 1895, i., 6.
,, ,,: Deut. med. Woch., 1895, xxi., 180.
,, ,,: Arch. f. klin. Chir., 1921, cxviii., 878.
,, ,,: Monats. f. Unfall., 1928, xxxv., 65.
,, ,,: Arch. f. Orthop., 1928, xxvi., 471.
Ludloff, K.: 15 Kong. der Deut. Orthopäd. Gesells., March, 1920, p. 183.
Rigler, L. G.: Amer. Jour. Roent., 1931, xxv., 749.
Schultz J.: Bruns' Beitr. z. klin. Chir., 1900, xxvii., 363.
Verneuil: Bull. de l'Acad. de Médecine de Paris, 1892, xxviii., 496.

THE USE OF
LIPIODOL IN SURGERY OF THE BILIARY PASSAGES

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(WITH ILLUSTRATIONS ON PLATE)

While the use of lipiodol in the post-operative management of cases involving the biliary ducts is by no means new, general application of the method is unusual. Gabriel[1] in 1930 described a case where a biliary fistula was demonstrated by X rays after the injection of lipiodol, and Ginsburg and Benjamin[2] reported a series of cases in the same year.

During the course of operations on the gall-bladder it is sometimes a surgical necessity to explore the common bile-duct when the latter is dilated and when the presence of stones is suspected. Often it is possible to suture the common bile-duct with safety after incision and exploration; in these cases a drainage-tube is desirable, secured to the suture line by a single stitch. Usually the suture line remains watertight, and no bile is discharged through the precautionary tube. There are occasions, however, when the local pathology of the ducts demands drainage by a catheter, especially where numerous stones have been removed from the ducts and where infection of the latter is present.

In my own series, consisting of 110 operations for cholecystitis, the common bile-duct was explored 27 times with 4 post-operative deaths. The proportion of cases with stones in the gall-bladder or ducts represented 80 per cent., whereas in a previous investigation of 153 cases, 87 per cent. had the combined pathology of inflammation and stones.[3] Out of the 27 explorations of the common bile-duct, stones were found in the ducts and removed in 16 instances (see Table).

Operations on the biliary tract (over 80 per cent. had stones in addition to cholecystitis)		110
Cholecystectomy		82
Cholecystostomy		17
Exploration of biliary ducts—	Cases	
(*a*) Through stump of cystic ducts	3	
(*b*) Exploration and immediate suture	6	
(*c*) Exploration and subsequent drainage by catheter	17	27
(*d*) Generalised inflammatory sclerosis of the ducts	1	
Stones present in biliary ducts		16
Number of lipiodol injections carried out		14

INDICATIONS

In 3 of the 27 cases in which exploration of the ducts was necessary, it was carried out through the stump of the cystic duct. In another case a generalised inflammatory sclerosis of the ducts was found a year after cholecystectomy had been performed; in this case no drainage was instituted. In 6 cases the bile-duct was sutured after exploration, but in 17 a catheter was stitched into the duct for various reasons, usually where numerous stones had been removed or where infection was present.

In a few of the latter cases it was not certain at the time of the operation whether the ampulla of Vater was patent, owing to the necessity of concluding the operation rapidly in view of the poor condition

or advanced age of the patient. In an elderly patient with jaundice due to a stone in the common bile-duct the operation may be necessarily a hurried and inadequate one, and the time required for complete exploration of the ampulla not available without undue risk. To quote the late Mr. Frank Jeans, "better a live problem than a dead certainty." Moreover, even with available time to pass a bougie, or to pass a rubber catheter and subsequently to pump saline through it into the duodenum, it is possible to miss a small stone, especially where there is much thickening in the vicinity of the ampulla, and where chronic pancreatitis is a prominent complication. Kehr admitted missing stones in the biliary ducts in 2·5 per cent. of 1105 operations, and Deaver reported that second operations constituted 4 per cent. of 1189 explorations of the biliary passages.[4] It is in the post-operative management of such cases as these that this method appears to be of value. Lipiodol is especially useful in what might well be called "second-hand" operations on the biliary tract. These cases are notoriously dangerous and difficult, and four examples are included among the present series. In connexion with these second-hand cases, the incision of choice appears to me to be a Kocher when a paramedian has been used on the previous occasion. A Kocher incision ensures that the operative field lies between the adhesions caused by the previous operation and the liver, and frequently the general peritoneal cavity is completely excluded, a useful feature when biliary drainage is contemplated.

Many tests have been used at various times for determining the patency of the common bile-duct. Among the better known tests are the following:—

1. The examination of the stools for bile-pigment.
2. The introduction of an Einhorn tube into the duodenum and the injection through the tube of magnesium sulphate solution. No bile is obtained through the tube when the common bile-duct is completely blocked.
3. The disappearance of jaundice.
4. The van den Bergh test.
5. If a T-tube has been introduced into the common bile-duct for drainage purposes, jaundice will occur when the outer extremity of the tube is clamped if there is not free entry of bile into the duodenum.

The most commonly used test is that mentioned first, but the following obvious fallacy suggests itself. If the fæces are normal in colour, bile is entering the duodenum without hitch; but where it is necessary to drain the common bile-duct for several days, all the bile may be discharged through the drainage-tube in spite of the fact that the ampulla of Vater is patent. Thus, this time-honoured test is not of great value where drainage of the common bile-duct is taking place. In fact, none of these tests are reliable criteria as there may be a partial suppression of bile giving light-coloured stools with a patent duct.

Finally, injection of lipiodol will not only indicate whether the block is partial or complete, but will demonstrate the site, and will exclude that due to spasm of the muscle of Oddi. If the lipiodol is held up in the common hepatic duct or supraduodenal part of the common duct, it is suggested that the usual cause is fibrous stricture, while ampullary blockage is commonly due to a stone if muscular spasm is excluded. Although the very definite advantages of the T-tube must be freely admitted, I have never succeeded in overcoming a prejudice due to the split in the common duct necessarily produced when finally withdrawing the tube, and due to the bulky T junction. This may or may not predispose to stricture formation, but I feel safer with a soft rubber catheter which can be introduced through a small incision in the duct, can be removed without causing any further damage, and has in my experience provided excellent drainage. Further, although in previous papers the injection of lipiodol has been carried out through a T-tube, equally good results can be obtained through a soft catheter.

Although it is the usual custom in this country, and my own practice, to remove this catheter ten days to two weeks after the operation, Overholt[5] is strongly of opinion that it should not be removed before the patency of the biliary tract has been demonstrated by lipiodol. His statement that a tube in situ is easier to deal with than a biliary fistula appears at first sight to require some consideration; but a recent case has convinced me that a tube is certainly safer than a fistula. In this case drainage of the common duct had been carried out by another surgeon 14 days previously. On the 10th day the tube was removed, and on the 11th the fistula superficially closed, and pain and discomfort were experienced in the right upper quadrant of the abdomen. On the 14th day general "bile" peritonitis suddenly supervened, and at operation large quantities of bile were evacuated from the peritoneal cavity. What had happened was that bile had collected in the region of Morison's pouch, owing to ampullary block and to premature closing of the biliary fistula.

A further argument in support of Overholt's view is furnished by Pribram's method (described below) for the solution of ampullary stones by ether.

TECHNIQUE OF INJECTION

About ten days after the operation, 10–20 c.cm. of warmed lipiodol are slowly injected into the tube draining the common bile-duct. Before doing so, any bile in the tube is aspirated, and care is taken to use no force in injecting the opaque liquid. Immediate radiography will show the lipiodol in the duodenum if the duct is patent; it is remarkable with what rapidity the lipiodol passes into the duodenum, and it is almost impossible to outline the ducts in such a case. For this reason lipiodol cannot be relied upon to demonstrate a residual stone which is not causing obstruction. The non-opaque stone may be outlined by adsorbed lipiodol, but the latter passes on so quickly into the duodenum that no indication may be given.

The radiogram, however, may reveal the lipiodol filling the common bile and common hepatic ducts and stopping short at the ampulla. This hold-up may be due to spasm of the ampullary sphincter or to an impacted stone. In the former case, a second radiogram taken three-quarters of an hour after the hypodermic administration of atropine may reveal that the lipiodol has passed into the duodenum. If the opaque fluid has entered the duodenum either before or after the administration of atropine, the tube draining the common bile-duct may be withdrawn with safety on the tenth day after the operation with the confident expectation that recovery will take place without either the supervention of jaundice or of persistent biliary fistula. If, on the other hand, the lipiodol is persistently held up at the ampulla, a stone in that situation is very probable.

VARIOUS CONSIDERATIONS

The sphincter of Oddi.—There is considerable divergence of opinion as to the effectiveness of this sphincter. Pribram[6] states with conviction that sphincteric spasm occurs frequently and may produce characteristic symptoms. This view is supported by Kretchner,[7] who reproduces an interesting radio-

gram in which the lipiodol is shown filling the common bile and hepatic ducts and also outlining the lower end of the duct of Wirsung. This observation seems to throw some light on the pathology of acute hæmorrhagic pancreatitis. On the other hand, as previously mentioned, all observers have commented on the rapidity with which the opaque fluid enters the duodenum in the great majority of cases.

Biliary dyssynergia or spastic dyskinesia.—While this condition of abnormal tonus of the ampullary sphincter may be deduced by the use of the duodenal tube, it can only be positively demonstrated by injection of lipiodol. There is steadily increasing clinical and physiological evidence not only of the effectiveness of the sphincter but also of the occasional presence of biliary dyssynergia.

Reference may be made especially to the recent work of Russell Best and Frederick Hicken.[8] These authors compare lesions of the ampullary sphincter with cardiospasm, pylorospasm, &c., and bring forward much radiological evidence that biliary dyssynergia may produce a definite mechanical block to the passage of bile into the duodenum. It is further claimed that the subsequent dilatation of the biliary ducts may produce attacks of biliary colic, and that the condition may be independent of cholangitis, the presence of stones, strictures, duodenitis, or pancreatitis. This view offers a reasonable explanation of the occurrence of biliary colic and of the so-called "hepatic neuralgia," and accounts for the persistence of gall-bladder symptoms in some few individuals after removal of the gall-bladder. These post-operative symptoms have usually been attributed in the past to congestion or infection of the ducts, or to the elusive "missed stone." When a definite diagnosis of biliary dyssynergia has been made by injection of lipiodol, the post-operative régime should include substances which relax the choledochal sphincter such as atropine, magnesium sulphate, or fats. It is interesting to contemplate the possibility of biliary dyssynergia, occurring as a primary condition, causing stagnation of bile and predisposing to the precipitation of stones.

Additional applications.—The method may also be applied where cholecystostomy has been performed, the opaque fluid filling the gall-bladder and the ducts provided the cystic duct is patent. Similarly, where the gall-bladder has been drained in a case of acute pancreatitis it is helpful as well as instructive to demonstrate or exclude sphincteric spasm.

Possible dangers of the method.—Tenney and Patterson [9] have recorded a case where pyrexia, jaundice, and abdominal pain were produced by the injection of bismuth paste under pressure into a biliary fistula. The explanation here seems to be the simple one of a thick paste blocking both fistulous tract and common bile-duct, especially as the symptoms subsided subsequently. It is obvious that bismuth paste is highly unsuitable for this diagnostic measure.

Mallet-Guy, Beaupère, and Armanet,[10] who record the onset of similar symptoms some hours after injection of lipiodol, are inclined to blame the viscidity of lipiodol blocking the common bile-duct and pancreatic ducts, and the production of "pancreatic œdema." In the latter case, however, there were several anomalous features. For instance, the jaundice was of painless onset following a course of neosalvarsan, and no stone or obstruction of the ducts was found at operation. Moreover, two further injections of lipiodol were given after the original 20 c.cm. in an attempt to outline the biliary tract. In my opinion it is a great mistake to aim at outlining the ducts. If there is no obstruction the opaque solution passes into the duodenum with great rapidity, and little more than a minute residue is to be seen in the ducts. For this reason it is difficult to demonstrate with certainty a stone not producing a complete block. Occasionally, such a non-opaque stone is shown in the radiogram as a clear area outlined by lipiodol. Again, it is difficult to assess the value of outlining the biliary tract in cases of obstruction. It is sufficient for practical purposes to test the patency or otherwise of the biliary system, and this appears to be a safe procedure. I have carried out the diagnostic injection of lipiodol in 14 cases without the production of symptoms or other effects in any instance.

Ether solution of stones impacted at the ampulla.—When a stone has been demonstrated at the ampulla by lipiodol, Pribram advises the daily injection of a few cubic centimetres of ether into the tube draining the common duct for several days. He has shown that ether disintegrates certain gall-stones by dissolving the cholesterol nuclei, thus reducing the stones to a pultaceous mass. The latter passes readily through the ampulla into the duodenum. The application of this method to the treatment of biliary fistulæ is obvious. A fine rubber tube is introduced through the fistula down to the obstruction, and the subsequent daily injections of ether may obviate a difficult and dangerous operation in cases where the obstructing agent is a stone.

I have not had an opportunity of using ether as a solvent of gall-stones, for in the cases recorded below the lipiodol passed into the duodenum either before or after the administration of atropine; but from Pribram's recorded cases this method seems to deserve extended trial.

CASE REPORTS

CASE 1.—This was a woman, aged 67, who had had an operation for cholecystectomy performed some years previously. Operation was necessitated by repeated attacks of severe biliary colic associated with jaundice. The jaundice varied in intensity but never completely cleared. Her general condition was poor, and there was some jaundice at the time of operation. In view of the two latter facts, and of her age, the operation was necessarily a hurried one performed under gas-oxygen anæsthesia. Many adhesions had to be separated before the common bile-duct could be exposed and incised. Several faceted stones were removed from the common bile-duct, but her condition did not permit of more than a hasty palpation of the ampulla of Vater. A catheter was inserted into the common bile-duct and drained bile for nine days after the operation. Lipiodol (10 c.cm.) passed easily through the common bile-duct into the duodenum (Fig. I. on Plate), so the tube was removed on the ninth day. She was discharged from hospital three weeks after the operation and has not had either jaundice or biliary colic from that date.

CASE 2.—This was a male, aged 20, who was admitted to hospital with severe biliary colic which settled down, but was succeeded by jaundice. At the operation a strawberry gall-bladder with thick pink walls was removed and the common bile-duct exposed. When the common bile-duct was opened a collection of "bile mud" was evacuated. The subsequent bile was normal in appearance and consistency. The ducts appeared to be subacutely inflamed, and a row of elastic glands were found in the right edge of the gastrohepatic omentum immediately behind the common bile-duct. These glands appeared to be secondary to the strawberry gall-bladder, and subsequent microscopic examination confirmed that their origin was inflammatory. Several of the larger glands were excised in order to avoid extrinsic pressure on the duct. It was found possible to pass a 7/10 bougie through the common bile-duct into the duodenum with

ease. A catheter was inserted into the common bile-duct and the operation concluded. A few days later radiography revealed the lipiodol in the duodenum (Fig. II). This patient was discharged from hospital three weeks after operation, his jaundice having completely cleared and his wound healed.

CASE 3.—This was a female, aged 48, who had had two previous operations elsewhere, one of which consisted of cholecystectomy, incision of the common bile-duct, and removal of stones from the hepatic and common bile-ducts. A subsequent operation was performed for incisional hernia. She was admitted to hospital suffering from severe biliary colic, and a history of two recent mild attacks of jaundice. The abdomen was opened through a Kocher's incision, and the common hepatic duct exposed after a prolonged and arduous separation of adhesions. The common bile-duct and the duodenum were welded together by dense inflammatory adhesions that defied separation. The common hepatic duct was opened and several stones removed from it and the common bile-duct. A probe passed into the duodenum, but the probe could not be identified in the dense inflammatory mass just above the first part of the duodenum. A drainage-tube was inserted into the common hepatic duct and the operation concluded. Although it was possible to pass the probe into the duodenum, it was not possible to exclude completely stone or stones at the lower end of the common bile-duct, so that it was very satisfactory, a few days later, to obtain a clear radiographic picture of the common bile-duct and to see that the lipiodol had passed without hitch into the duodenum (Fig. III). The patient subsequently had an uninterrupted convalescence.

CASE 4.—This was a female, aged 62, who had had two previous operations—one for cholecystectomy and another for a perforated gastric ulcer. Her general condition was poor and there was definite evidence of myocardial degeneration. Operation was necessitated by repeated attacks of severe pain. The abdomen was opened through a Kocher incision and the common bile-duct exposed. The adhesions were especially dense as the previous perforated gastric ulcer added its contribution of adhesions to those due to the cholecystectomy. The common bile-duct was opened, stones removed, and a catheter inserted into the duct which was approximately one inch in diameter. A 9/12 bougie passed easily into the duodenum; the operation was concluded. After the operation her condition was never satisfactory, but the patency of the common bile-duct and ampulla of Vater were demonstrated by the rapid passage of lipiodol into the duodenum (Fig. IV.). Unfortunately, however, her condition became steadily worse, and death occurred one month after the operation. A post-mortem was not obtainable, but all clinical evidence went to suggest the cause of death to be myocardial failure rather than any biliary upset. There was no suppression of bile at any stage of her illness.

CASE 5.—This woman, aged 48, came into hospital with a history of three attacks of severe abdominal pain and vomiting, said to have been associated with the doubtful appearance of jaundice on one occasion. One of these attacks had occurred a few days before her admission to hospital. When examined there was protective spasm and tenderness over the whole of the upper abdomen, especially over the gall-bladder. Radiography of the latter revealed two opaque gall-stones in the gall-bladder, which did not fill or excrete dye. The gall-bladder was exposed by a Kocher's incision, and chronic cholecystitis and cholelithiasis were found, in conjunction with subacute pancreatitis. The pancreas was swollen, œdematous, and inflamed, and there were small areas of recent fat necrosis. Obviously, the attack from which she had suffered several days before admission to hospital had been that of an acute or subacute pancreatitis. The gall-bladder was opened, the stones removed, and a cholecystostomy performed. It was decided not to drain the pancreas as there did not appear to be any indication to do so, especially as the condition was obviously subsiding.

This patient's convalescence was smooth, and a radiogram of a subsequent injection of lipiodol through the tube draining the gall-bladder revealed the opaque fluid in the duodenum (Fig. V.).

SUMMARY AND CONCLUSIONS

1. Operations on the biliary passages often present difficulties, especially where the post-operative management is complicated by doubts as to the patency of the ducts. 2. The usual clinical tests for determining the patency of the ducts, especially the presence of bile-pigment in the fæces, are often fallacious. 3. The injection of lipiodol into the common bile-duct presents no difficulty, is not dangerous in itself, and yields valuable information. 4. The lipiodol method determines the prognosis with accuracy. Further, it indicates the advisability or otherwise of removal of the tube draining the common bile-duct, and the possible application of additional measures. 5. The condition of biliary dyssynergia affords a reasonable explanation for post-operative symptoms in patients where cholecystectomy has been carried out. The diagnosis of this condition can only be made positively by means of the lipiodol injection, and when such a diagnosis has been made, post-operative treatment should be directed towards promoting relaxation of the ampullary sphincter. 6. Some typical examples are described in which the lipiodol method has proved of value.

I am indebted to Dr. P. H. Whitaker whose welcome help has been of the greatest assistance to me from the radiological aspect.

REFERENCES

1. Gabriel, W. B.: THE LANCET, 1930, i., 1014.
2. Ginsburg, L., and Benjamin, E. W.: Ann. of Surg., 1930, xci., 233.
3. Ross, J. C.: Brit. Med. Jour., 1932, i., 1026.
4. Short, A. R.: Index to Prognosis, Bristol, 1932.
5. Overholt, R. H.: Surg., Gyn., and Obst., 1931, lii., 92.
6. Pribram, B. O.: Ibid., 1935, lx., 55.
7. Kretchmar, A. H.: Amer. Jour. Surg., 1933, xxi., 383.
8. Best, B. R., and Hicken, N. F.: Surg., Gyn., and Obst., December, 1935, p., 721.
9. Tenney and Patterson: Jour. Amer. Med. Assoc., 1922, lxxviii., 171.
10. Mallet-Guy, Beaupère, and Armanet: Lyon méd., 1927, cxl., 215.

Clinical and Laboratory Notes

BEDSIDE RADIOGRAPHY FOR A FRACTURE

BY W. B. R. MONTEITH, M.A. Camb., F.R.C.S. Edin.

(WITH ILLUSTRATIONS ON PLATE)

AN agricultural labourer of 75 presented himself at my house recently suffering from a cold in the head incapacitating him from work. This was two years after he had fractured his femur and a few days after I had been reading about the need for fracture clinics in this country. It seems to me in retrospect that this man's sound functional recovery and ability to do full work illustrates first the value of detail in treatment, and secondly the value of radiography in bed without disturbance. These should be available whether the patient is treated at home, in hospital, or in a fracture clinic.

At the age of 73 this man fell heavily from a haycart. Shortly after admission to the Butterfield Hospital, Bourne, X ray examination (Fig. I. on Plate) showed a comminuted fracture of the left femur, involving shaft, neck, and both trochanters. By means of strapping along the length of thigh and leg traction was applied, with the leg rested in a Thomas splint and abducted and flexed at the hip-joint. A subsequent radiogram, taken without moving the patient, showed satisfactory abduction, protraction, and alignment, but with small trochanter displacement, due undoubtedly to pull by the psoas (Fig. II.). It then seemed best that the abduction and flexion should be maintained without further protraction.

A rigid iron frame was made to extend from lower ribs to calf, having riveted to it at right angles a half hoop to embrace thorax and cross strips at mid-thigh and calf; and having the longitudinal strip bent, at the level of the hip-joint, outwards through 30° to maintain abduction and upward through 40° to maintain flexion. This was incorporated in a plaster-of-Paris case extending from the lower ribs and enclosing the foot on the left side, and to the knee on the right. X ray examination then showed satisfactory disposition of the fragments (Fig. III.). After two months the left knee was liberated, the metal support having been sawn through at that level, and the plaster case removed from knee downwards. After three months weight bearing was permitted while still wearing the plaster case. Four months after the accident the patient was discharged from hospital wearing a walking calliper. This he discarded (contrary to instructions) after a few weeks, for he complained that it interfered with digging! Fig. IV. shows the state of affairs seven months after the injury.

It is now two years since the accident, and for more than twelve months he has been doing full work including potato digging. There is a good range of movement at the hip, though some limitation of abduction, and no measurable shortening. The man himself admits no disability.

The successful result emphasises once more the fact that stereotyped methods of treatment are inadvisable. On the positive side it points to the extreme value of intercurrent radiography, without disturbance of limb or patient, as a means of making the treatment suit the patient.

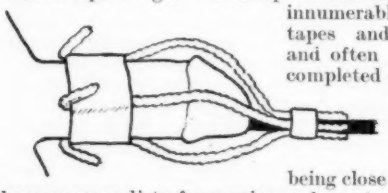
Bourne, Lincs.

A METHOD OF TYING IN A CATHETER

By G. B. Davis, M.R.C.S. Eng.

HOUSE SURGEON TO THE UROLOGICAL DEPARTMENT AT KING'S COLLEGE HOSPITAL, LONDON

Many methods have been devised for keeping a catheter securely in place, ranging from simple but primitive devices to elaborate "machines." Probably the method most commonly used now, in hospital and private practice, is the system of tapes tied to the catheter, the four ends being held to the penis by an encircling band of strapping. Even this has disadvantages. (1) It takes time to put on neatly. One is apt to get "tied up" with the seemingly innumerable ends of tapes and strapping, and often when it is completed all the tapes are not equally taut. (2) The tapes, being close to the penis, become very dirty from urine and pus tracking round the catheter. (3) With the slight and unavoidable tension on the catheter, the tapes become taut, and cut into the penis as they converge on the catheter. This occurs especially as they cross the corona, and I have often seen ulcers where tapes, hardened by dried urine and pus, have cut into the glans. This is, perhaps, the greatest objection to the method. (4) If the catheter has to be changed, or removed temporarily (e.g., for cystoscopy), the whole apparatus must be removed and a fresh one applied.



These objections may appear trivial but in practice are very real. The appearance of things after a catheter has been kept tied in for a week in a patient with infected urine or urethritis is enough to make one most dissatisfied with the tape method.

The following method aims at meeting these disadvantages, and, if not entirely overcoming them, at least mitigating them. Its essential feature is the use of something more rigid than tapes. A material which was soft, stiff, and at the same time pliable seemed indicated, and for this purpose pipe-cleaners have proved the ideal thing. They cost 1*d.* per packet of 12, and four are necessary for each case, the "extra thick" variety being the best.

After the catheter has been passed, four pipe-cleaners are strapped with 1 inch Elastoplast strapping round the circumference of the penis, as near the base as possible. The four ends are then brought to the catheter and fixed there with a small strip of elastoplast, in such a way that each pipe-cleaner has a definite bow, and stands well away from the glans penis. The ends at the base of the penis are then bent back or cut off. It is important to apply the band of strapping loosely round the penis to avoid constriction and œdema, and to press it well on to the skin. The whole procedure takes under a minute, with practice, and has proved quite satisfactory.

Unlike the tapes, pipe-cleaners have the necessary rigidity to "stand away" from the penis and not press on the corona. Because they can be made to stand away, too, they are not soiled so soon by urine or pus. Being soft, they do not cut into the skin, and are quite comfortable to the patient. If the catheter has to be removed temporarily, the strapping holding the ends on the catheter is removed, leaving the pipe-cleaners in place, ready to be strapped again to the new catheter. The method is essentially simple, clean, and very easy to apply. By his kind permission, it has been used on the last 30 cases under the care of Mr. John Everidge.

AN UNUSUAL CAUSE OF INTERNAL HÆMORRHAGE

By Emlyn E. Lewis, F.R.C.S. Eng.

RESIDENT SURGICAL OFFICER, QUEEN'S HOSPITAL, BIRMINGHAM

Early in August, 1935, a man 77 years of age was admitted to the Queen's Hospital having collapsed in the street. He was suspected of having a perforated ulcer. He had been unwell for a few days, having shortness of breath. There was no indigestion. The collapse was ushered in by giddiness and by slight upper abdominal pain which by the time of examination had become severe and generalised. His pulse was rapid and thready, his temperature subnormal, and his skin cold and clammy. He was tender and rigid over the whole abdomen but particularly in the epigastrium; there was no diminution of liver dullness, and he had much pain in the right shoulder.

A diagnosis of mesenteric thrombosis was made, morphia gr. ½ was given, and rectal saline administered. The patient's condition improved and in two hours the abdomen was opened under gas-and-oxygen anæsthesia. The peritoneal cavity contained a great quantity of blood. The spleen was intact, and the stomach was delivered with abnormal ease owing to the lesser omentum having been torn away from the lesser curvature. The torn omentum was widely infiltrated with blood-clot and expanded to a thickness of about 2 inches. No actual bleeding-point could be seen, and there was no evidence of fresh hæmorrhage. The man's condition being grave,

(*Continued at foot of next page*)

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF EPIDEMIOLOGY

AT a meeting of this section on Jan. 24th, with Surgeon-Captain S. F. DUDLEY, the president, in the chair, a discussion took place on the

Use and Abuse of the Swab in Combating Diphtheria

Dr. H. J. PARISH, of the Wellcome Research Laboratories, Beckenham, began by saying that if immunisation were universal and timely the subject would be unimportant, but that there was still much diversity of opinion and practice. The responsibility for the diagnosis of diphtheria rested entirely with the clinician. In typical cases the swab should have only a confirmatory value, but where, clinically, the presumption was against diphtheria, it might help him to decide. Good technique was essential at the bedside as well as in the laboratory, and swab-taking should not be delegated to a student or nurse. An antiseptic gargle should not have been used for some time before using the swab, and with only a small nidus of infection care must be taken to rub the actual lesion and to avoid contamination with saliva. In a difficult case the bacteriologist should be given adequate data, and he, in turn, should issue his report without delay. He felt that antitoxin should be given whenever a swab was taken, as many lives were still being lost through failure to give serum early enough. The swab should be of greater value to the clinician and the medical officer of health as an administrative measure rather than as a diagnostic aid. Doubtful cases should not be notified until there had been a report on the swab. If negative, another swab should be taken, and if this was also negative the patient could safely be nursed at home, even in the presence of Schick-positive children: Vincent's angina or streptococcal sore-throat might, however, require hospital care. Caiger and O'Brien had reported that in 41 per cent. of 529 patients admitted as cases of diphtheria, and Dr. E. H. R. Harries that in 33·6 per cent. of 2099, a revision of the diagnosis was necessary. An "observation certificate" for admission to hospital would save much expense and a rebuff to the practitioner when his diagnosis was revised, but for this the L.C.C. system of isolation cubicles would be essential. Sometimes the membrane of a transient true diphtheria in almost immune persons might clear before admission to hospital and these might soon be discharged. It was often necessary to swab contacts in order to acquire early information about the spread of infection, and it was important to swab the nose as well as the throat, for there might be a positive result in one when the other was negative. In many outbreaks the real menace was the profuse carrier, but though those with few bacilli probably helped greatly in natural mass immunisation, the sparse carrier of one day might be a profuse and dangerous one on the next. The introduction of tellurite media had materially increased the proportion of positive reports and this increased the clinician's responsibility in interpreting them. It was of supreme importance to make virulence tests in convalescents and carriers, for they often harboured non-virulent forms.

In research the swab was invaluable in discovering the presence of diphtheria in Schick-negative reactors, the invasiveness of *Corynebacterium diphtheriæ gravis*, the carrier rate and the effect upon it of artificial immunisation, and the origin of natural antitoxin. Certain strains of the gravis type seemed to be more invasive than the strains met with a few years ago, and were responsible for most of the diphtheria in Schick-negative reactors. The degree of protection shown by a negative Schick test might occasionally be inadequate to prevent infection by virulent strains, and it should be the aim of the practitioner to confer as high a degree of protection as possible. With the increasing prevalence of the gravis organism in various parts of England not only had there been an increase in the number of cases reported in Schick-negative reactors, but sometimes also in the number of carriers associated with those cases. A high carrier rate in an immunised population might be due either to the immunisation itself or to a more virulent and invasive strain, but there was no doubt that mass immunisation very greatly reduced the incidence of diphtheria.

The clinician must realise that the newer knowledge had complicated the work of the bacteriologist and this might explain some of the negative reports in undoubted clinical diphtheria. Some modification of laboratory technique was therefore desirable, and Dr. Parish suggested as a method, first, the examination of the direct smear, chiefly to exclude Vincent's angina, and then inoculation of a Löffler slope and of McLeod's chocolate tellurite medium, on a plate or, more conveniently, in a McCartney's screw-capped bottle. This enabled a report to be made in from 24–48 hours, but was difficult to carry out in a small laboratory. It tended, however, to shorten the bacillus and make microscopical recognition difficult. A simpler alternative was to give a preliminary report in 18 hours from a Löffler slope and, later, a full report after a thick subculture of the easily made Horgon and Marshall's blood tellurite medium and after fermentation and virulent tests. The great advantage of the tellurite medium over Löffler's was that it produced an increase of 10–25 per cent. in the positive results. It also differentiated the Klebs bacillus from Hofmann's and the gravis type from the others, and by inhibiting the growth of other organisms it allowed the colonies to be picked out.

The swab saved precious time in making a diagnosis and though improvements in technique had added to the cost the full laboratory examination was not necessary in the ordinary typical case. He had himself found the serum-treated swab most valuable for accelerating the report. He had described it in a letter to THE LANCET,[1] and had shown that an accurate report could be made in two hours in 80 per cent. of clinical diphtheria and in four hours in

[1] THE LANCET, 1935, i., 400.

(*Continued from previous page*)

after evacuation of the blood, the abdomen was hurriedly closed. It was suspected that the left gastric artery had ruptured, possibly through an aneurysm. Three days later the patient died, and post-mortem examination showed syphilitic aortitis, aneurysmal dilatation at the origin of the cœliac artery, and rupture into the lesser omentum of an aneurysm about an inch in length situated on the left gastric artery. Evarts Graham in his "General Surgery" (Chicago, 1931) records almost a similar case treated successfully by Green-Powers.

95 per cent., contrasting with 83 per cent. after the 18 hours necessary by Löffler's method. The value of the swab was highest in administration and research as it was desirable to have the largest possible number of isolations. It was often very difficult with persistent carriers to decide if they were to be released from strict isolation before they became bacteriologically negative. This step should only be taken after a thorough overhaul of the upper respiratory passages by a competent specialist. Swabbing must not be used as a primary or even chief means of diagnosis, for diphtheria was a disease, not a mere bacteriological finding. It was also necessary to differentiate clinical diphtheria from the mere presence of the bacilli in the throat. Finally, he urged that every hospital should have its own bacteriological laboratory and that there should be closer coöperation between clinician and bacteriologist, but the onus in regard to early diagnosis and treatment rested with the physician.

Dr. C. O. STALLYBRASS (Liverpool), from the point of view of public health and hospital administration, discussed the value of the swab for diagnosing diphtheria before admission, in the isolation hospital, and in carriers and "missed" cases. He assumed that the swab was supplementary to artificial immunisation. Of 200 consecutive cases admitted to Liverpool hospitals as diphtheria, the diagnosis was confirmed in 175: the average age was 10 years; the average delay in calling medical aid was 36 hours, with a further 16 hours before the first dose of antitoxin was given; the mortality was 8 per cent. Swabs were much more often taken from adults than from children, and the delay in sending for the doctor was much greater in fatal cases. The condition of the patient, judged by the dose of serum on admission, was much graver in the fatal cases and in those who had not been swabbed outside, whose mortality was little more than half the average of the series (4·8 as against 8). The main causes of death were a severe type of infection and failure to realise the gravity of the infection in young children (by doctors as well as by parents). He urged the use of the swab in all doubtful cases, especially in children under 7 years of age. He advocated the more frequent swabbing of the nose. If a positive swab taken outside the hospital was not necessarily proof of diphtheria, still less did a negative swab show its absence. Swabs negative to diphtheria often showed Vincent's angina and swabbing was invaluable in the differential diagnosis.

In hospital the use of the swab had been radically changed by the division into "gravis," "intermediate," and "mitis" types. In Liverpool a case notified as diphtheria was seen on admission by a resident medical officer. Clinical diphtheria was sent to a general ward, doubtful cases to a bed-isolation ward or cubicle. A swab was at once taken and a Schick test carried out, followed, if necessary, by a dose of serum after four to six hours. The cultures if positive were tested for virulence, and if negative a second culture was made a few days later. Of 145 gravis only 1 and of 116 intermediate strains only 4 were non-virulent, but of 121 mitis strains 43 were non-virulent. The proportion of the gravis type in various cities was found from the literature to vary greatly.

With an outbreak of diphtheria in a children's ward, a kind of standstill order should at once be put into operation. The children could be separated into four groups: (*a*) Schick-positive, swab-positive; these should be isolated and receive a dose of serum. (*b*) Schick-negative, swab-positive; carriers who should be isolated until a virulence test was done. (*c*) Schick-positive, swab-negative; these should be left in the ward and immunised. (*d*) Schick-negative and swab-negative; these remained in the ward and needed no further treatment. After this the standstill order could be relaxed.

The abuse of the swab lay mainly in allowing the bacteriological finding to warp the judgment, causing clinical diphtheria to be called something else, or a mere carrier an active case. This, however, still left open the question of what constituted clinical diphtheria.

Dr. J. D. ROLLESTON agreed with both the previous speakers that there was a need for collaboration between physician and bacteriologist, and that the onus in diagnosis rested primarily on the physician. There was still too often delay in giving antitoxin or in sending patients to a fever hospital, because a swab had not been received or was negative. Malignant diphtheria might simulate quinsy or mumps, and a swab might be negative because the bacilli were too deep in the mucous membrane, and it only became positive when the membrane began to separate. The danger of a wrong diagnosis was shown when 58 per cent. died of 40 patients with malignant diphtheria which had been incised, compared with 3·4 per cent. of other cases of equal severity. The direct smear helped to diagnose Vincent's angina and to show the prevalence of other organisms, but it should be limited to acute faucial diphtheria. A negative swab might be due to the struggling of the child, to applying it too soon after meals, to a recent use of antiseptic, or to the inexperience of the examiner. In the skin, diphtheria might simulate eczema, herpes, different forms of suppuration, and in wounds, in a number of which diphtheritic paralysis resulted. Obstinate whitlows would disappear after a small dose of diphtheria antitoxin. He was sceptical of the practical value of terminal swabbing before the patient was discharged from hospital; a negative swab was no guarantee that the patient was free from infection, and the return rate was no higher in hospitals which had given up this practice. It had, however, a certain forensic value.

The CHAIRMAN referred to a psychological abuse of the swab. If there were no such measure as swabbing, the practitioner would probably treat all his cases of diphtheria with antitoxin at once. He had found a 25 per cent. increase in the number of positive swabs by examining at 48 hours as well as at 24 hours, and he thought terminal swabbing would be much more valuable if the criterion of freedom were seven consecutive negative swabs in a week. He pleaded for more simultaneous Schick and swab tests, and more information was needed about isolation of carriers.

Dr. G. BOUSFIELD said that in poor districts the practitioner much opposed giving antitoxin to a patient unless he could prove to the relatives that it was necessary. If a case looked like diphtheria it should be treated as such by the doctor, or he should send the patient to an appropriate place. After having done 15,000 primary Schick tests, he had noticed that they were becoming less strongly positive. Care was needed before treating all the less profuse carriers, as that might upset Nature's balance and interfere with the process of natural immunisation.

Dr. E. A. UNDERWOOD objected to the text-book statement that antitoxin should be given whenever a swab was taken. It was also a questionable policy

to have doubtful cases removed to a fever hospital for observation.

Dr. E. W. GOODALL did not think it necessary to indulge in universal swabbing, and remarked that advocates of this did not include the staffs of fever hospitals. He had not met cases in which diphtheritic whitlows had caused other cases of diphtheria.

Dr. R. A. O'BRIEN thought every effort should be made to shorten the period in making a report on the swab.

Dr. CLARK TROTTER said it was difficult to get the practitioner to understand what he ought to do in cases of diphtheria. On the appearance of one case in a household the family doctor might swab all the other members and all who had been in immediate contact, just because he felt he was expected to do it. To eliminate mixed infections, Dr. Trotter said he was in the habit of giving every case of scarlet fever a prophylactic dose of diphtheria antitoxin; this greatly improved the scarlet fever cases and prevented any possible spread of diphtheria.

SECTION OF DISEASE IN CHILDREN

AT a meeting of this section held on Jan. 24th, with Sir LANCELOT BARRINGTON-WARD, the president, in the chair, a paper on

Metabolism, General Nutrition, and Growth in Infancy and Childhood

was read by Dr. E. P. POULTON. He said that the work he had done with Mr. T. W. Adams possibly provided a new way of studying these problems, and he was bringing it before the section in the hope of getting assistance. He had had occasion to recalculate the metabolism results of Benedict and Carpenter from oxygen-consumption and respiratory quotient, and had found that in children these results differed from those obtained by calorimetry. Assumptions from the respiratory quotient were misleading, and he felt that carbon dioxide output should be regarded more truly as a measure of metabolism. By plotting the logarithm of the carbon dioxide against the logarithm of body-weight he found a linear increase up to 18 months, a flattening from 18 months to 4 years, and then a linear increase again. That is, as the child passed from 18 months to 4 years, the carbon dioxide output remained constant while the body-weight increased. A possible explanation was that when the child started walking more actively he lost fat, and metabolism continued thereafter at a slower rate. If this were so, there should be an alteration in the relationship of height to weight at this period, the gain in height increasing as compared with the gain in weight. Dr. Poulton demonstrated further graphs in which the logarithm of height and the logarithm of weight of children from birth to adult age were considered. There were inflexions in the curve when the body-weight reached 10 kg. (22 lb.) between the ages 10 months and 2 years, and again when the body-weight was about 18 kg. (39·5 lb.) at age 4–5 years. A third inflexion occurred at 15 years when body-weight was from 50 to 55 kg. (110 to 120 lb.). The slowing of the weight increase between 1 and 4 years without a proportional slowing in height increase could be explained by loss of fat, and the fact that metabolism remained about constant at this period, despite increase in weight, was regarded as due to the disappearance of luxus consumption associated with the fat of babyhood.

The relation of height to weight represented general nutrition, and could be used with advantage to compare the general nutrition in different types of children and in different strata of society. An important question was whether nutrition was constant in different social strata. Baldwin had collected measurements in the United States which incidentally showed the change in relationship of height to weight at 5–6 years and again at 15½ years. The old figures of Roberts on public-school children and those of artisans showed what was generally agreed, that height and weight bore the same relationship to each other in all classes, so that this relationship could be roughly called an index of growth. There must, however, be a third factor, time, entering into it. It was usual to correlate time or age with weight, but when age and height are correlated there was a much closer agreement with the growth curves. Dr. Poulton showed charts to illustrate this point, taking measurements of boys from an Oxford preparatory school from 8 to 13½ years and older boys from Epsom College. It was interesting that Roberts's figures from the 'eighties, of height and age of boys, at public schools, naval and military colleges, and universities, and medical students, fell below what is regarded as ideal to-day. Fleming and Martin's statistics from Wales, including some elementary school-children, showed lower curves, while Greenwood's from elementary schools all over the country were lower still. Elderton's figures for Glasgow children taken by districts were all graded according to the social status. So in comparing the different classes of the community of varying social strata, while the height-weight curves were constant, the lower classes were less tall for their age, and practically speaking the social status could be graded by this property.

Prof. LEONARD FINDLAY was glad that Dr. Poulton had shown the fallacy of the height-weight index; these two were measurements of two totally different things—the height of growth and the weight of nutrition. There was a real difficulty with regard to standards; comparison of private patients with, say, Baldwin's measurements showed the former as sometimes as much as two or three years above the latter. Rate of growth of height and of weight varied much in different social classes. Another interesting point was the focusing of attention on the first eighteen months of life. In a study undertaken with Prof. Noel Paton, he had found that the rate of growth was strikingly greater during this period, and he thought that in questions of undernutrition this was the period on which to concentrate if valuable time was not to be lost.

Dr. ALAN MONCRIEFF emphasised again the importance of considering the carbon dioxide output in estimating the metabolism in young children. The oxygen-consumption alone could be very fallacious. Secondly, he complained of the lack of proper growth standards for this country. Some years ago he had collected data from several foreign countries, and had found considerable variations. Yet we were content to accept as a standard figures from the mixed population of America. We could not begin to argue about malnutrition or undernutrition until we had standards for English children. He hoped that the promised and long-awaited anthropometric survey would shortly appear.

Dr. POULTON, in reply, pointed out that the height-weight relationship was only fallacious in so far as it was constant whatever class was studied. Brodie's figures for animals showed a difference between those fed improperly and those on adequate diets,

and he concluded that in this country all children got enough calories, and though a child could gorge himself on bread and gain weight, he would not grow taller. Possibly the difference in height in the different social strata resulted from lack of vitamins, and what was needed was more vitamin A, and perhaps D, rather than more calories. Dealing with the relation of height to weight, the height-age curve was straight, the weight-age curve flattened out, and height should be taken for measurement of growth. He wanted to stress the importance of weighing children naked. There was a real need for reliable observations on children from a statistical point of view.

SECTION OF UROLOGY

AT a meeting of this section held on Jan. 23rd, Mr. E. W. RICHES being in the chair, a paper was read by Dr. J. LEON JONA, of Melbourne, on

The Kidney Pelvis

its normal and pathological physiology, illustrated by cinematography and pyelograms. In a preliminary anatomical survey Dr. Jona pointed out that the segmental character of the embryonic kidney was preserved in the adult calyces. These, together with the infundibulum of the pelvis and the ureter, were enclosed by layers of smooth muscle which were found, on pyeloscopy, to contract rhythmically in a manner which the speaker compared with the systole and diastole of the heart muscle. If the pelvis were filled with radio-opaque fluid through a ureteric catheter and observed on the fluorescent screen this action could be followed. The calyces contracted in regular order from above downwards, each contraction lasting from 1 to 3 seconds and being followed by a resting period of similar duration. The infundibulum contracted in a similar fashion and forced the urine down into the ureter. Regurgitation into the calyces was prevented by a kind of "snap" action of the proximal part of the infundibular recess. The cinematograph which followed at this point had been prepared by an artist to whom the speaker had demonstrated the sequence of events in the living subject. The film showed very clearly, by a synthetic series of diagrams, the rhythmic contractions already described.

Aberrations in the regularity of this mechanism were found in a variety of pathological states such as atony, spasm of the whole kidney pelvis, spasm of the ureter at one point, or atony of the ureter. Pyelograms illustrating these different conditions were demonstrated. Spasm was frequently reflex in origin and might be due to disease of the gall-bladder or appendix, inflamed lymph glands, or to an aberrant renal artery. Dr. Jona had even seen spasm of the left ureter in a patient with gall-stones. Atony and dilatation could occur in the absence of obstruction and might be due to the action of the sex hormones. Antiperistaltic waves were frequently associated with spasm of the ureter at one point; they were also observed in the ureters in apparently normal subjects when the bladder was distended and micturition prevented. Such antiperistaltic waves were an obvious mechanism in the production of pyelitis should the bladder be infected. The use of pyeloscopy might assist in the early diagnosis of renal tumours when the only clinical symptom was hæmaturia. In pregnancy the ureters were often enlarged by as much as two-thirds of their normal size, and this was often accompanied by elongation and kinking of the upper or free part of the ureter. Such a condition was liable to persist in association with subinvolution of the uterus. Mr. Harold Burrows's observations on the effects of œstrogenic substances upon the musculature of the ureters were, said Dr. Jona, highly significant.

Dr. Jona demonstrated a graphic method of investigating pelvic pressure and contractility. In this the ureteric catheter is connected with a tambour and a record of the pressure is obtained on a revolving drum. With this apparatus he made a short record, using manual pressure on a rubber bulb in imitation of the conditions which would obtain in practice. Tracings in normal subjects, he said, showed a regular undulating curve corresponding with the rhythmic systole and diastole of the pelvis. A change from the horizontal to the sitting posture caused an appreciable increase in the intrapelvic pressure, as did also an increase of intra-abdominal pressure—for example, in deep inspiration. This graphic method of investigating the muscular activity of the urinary tract was of considerable service in distinguishing between cases of hydropelvis where the muscle would contract and those cases where atony prevailed. In the latter the addition of 10 c.cm. of fluid simply added to the distension without producing an appreciable rise in pressure. In such cases nephrectomy might be advisable, but it should always be borne in mind that if an obstructive cause could be found and removed a great degree of improvement was to be expected in the contractility of the pelvic musculature. The combination of pyeloscopy with graphic records of intra pelvic pressure was of considerable service in estimating the effects of drugs upon this part of the urinary tract. Thus, in one case, in which a tracing was demonstrated, a single dose of pituitrin had been effective in restoring a normal rhythm where dysfunction had previously prevailed. Both atropine and a small dose of histamine would cause a moderate rise of pressure. Acriflavine and mercurochrome had a similar effect which the speaker attributed to their action upon the muscle rather than to any antiseptic effect. One effect of aspirin was to lengthen diastole.

The observations described had all been made in women. Dr. Jona gave no account of his work on animals apart from a single experiment in which he demonstrated the deleterious effect of using too great a pressure upon the renal pelvis. In this the radio-opaque fluid had penetrated into the inferior vena cava and its branches.

DISCUSSION

Mr. YATES BELL said that in a series of 12 cases of renal pain he had found hypertonus of the pelvis in the majority. In one case, a girl of 12 who had suffered from intractable pyelitis for a period of from 4 to 5 years, an intravenous pyelogram was normal apart from the form of the calyces, which were small and globular. Pyeloscopy showed no contractions, but these were initiated by injecting 0.5 c.cm. pituitrin and, after a course of treatment with this drug, the patient's condition returned to normal.

Dr. N. S. FINZI considered that the modern fluorescent screen and improved X ray apparatus had been of enormous assistance in obtaining effective pyeloscopy. He thought that intravenous Uroselectan had superseded retrograde pyelography too extensively but there were indications that the pendulum was swinging back.

Dr. G. E. VILVANDRÉ suggested that the effects of pyeloscopy might be imitated by taking plates at

more frequent intervals in the course of a pyelogram. Ordinarily exposures were made at intervals of from 10 to 15 minutes; if plates were taken at intervals of one minute a record might be obtained of the contractions described by Dr. Jona. He also suggested that kinking of the ureter was fairly common and not by any means confined to pregnant subjects.

Mr. A. W. CUBITT discussed the bearing of intravesical pressure upon ascending infection of the urinary tract with special reference to cases in which prostatectomy had been performed. In such cases drainage of the bladder led to the conversion of a positive pressure into a negative one. He thought this might facilitate an ascending infection, and for this reason advocated complete closure of the bladder. He also described the relief of pain effected by atropine in a case of vesical stone.

Dr. JONA, in reply, remarked that cases such as Mr. Yates Bell had described were undoubtedly forthcoming if they were looked for. His only objection to Dr. Vilvandré's suggestion was based upon expense, which would be considerable. To Mr. Cubitt he expressed doubt as to whether the pelvis of the kidney would stand a negative pressure.

MEDICAL SOCIETY OF LONDON

Prof. G. E. GASK, the president, took the chair at a meeting of this society held at 11, Chandos-street on Jan. 27th, when Mr. V. ZACHARY COPE opened a discussion on

Acute Appendicitis

Even after the fifty years which had elapsed, he said, since Fitz's famous paper of 1886, the mortality from acute appendicitis was still considerable and did not show diminution. The main problems had always been to decide the best time to operate and how much ought to be done at the operation. J. B. Murphy of Chicago, than whom no one had done more to put the surgery of appendicitis on a sound footing and who had had an operative mortality of about 4 per cent., which would be considered good to-day, had emphasised the great importance of operating on all cases early and before perforation of the appendix. He had called this the first stage of the disease, applying the term "second stage" to that period, for about three days after perforation, when the inflammatory process was increasing and spreading. The operation, he had written, must then be a limited one: simple opening of abscess and relief of pus tension in the affected area, with the removal of the appendix if it were accessible and easily amputated. There should be the least possible separation of agglutinations. When the patient was apparently overwhelmed with intoxication, a simple incision was made and pus tension relieved with a large drainage-tube. In the third stage, the stage of subsidence of the acute symptoms, he had generally operated and let out pus. He had therefore operated promptly in nearly all cases. Where, however, the surroundings or low state of the patient and the absence of a competent surgeon contra-indicated an immediate operation, he had recommended Ochsner's treatment, with the warning that it required a great deal of judgment. Ochsner had aimed at changing a dangerous acute into a relatively harmless condition by inhibiting peristalsis and giving the peritoneum an opportunity to remove the infection by absorption or circumscription. He had not sought to avoid operation but had chosen the most favourable time for it. He had not only operated at once on every case in which he had thought the appendix was still unperforated, but had often operated promptly upon appendicular peritonitis. For the past thirty years the majority of surgeons had followed the teaching of Murphy. During the last few years, however, a number of the younger surgeons had questioned the wisdom of prompt operation at all stages. They regarded cases in which symptoms had been present for fifty hours as suitable for delayed treatment; they put the patient in the high Fowler position, allowed no purgatives and gave no morphine. They allowed only water by mouth. They did not recommend delay in young children or where the diagnosis was uncertain, and they regarded as additional indications for operation the previous administration of a strong purgative, superficial hyperæsthesia, and obvious general peritonitis.

IMMEDIATE AND DELAYED OPERATION

The advantages of the so-called immediate operation were that the exact pathological condition was ascertained, the infective focus was usually removed, the infective field was drained where necessary, and the patients and relatives were saved a trying delay. Its disadvantages in cases with perforation of the appendix were said to be the danger of spreading the infection, the greater frequency of intestinal obstruction and ileus, and the frequency of secondary abscesses, fæcal fistulæ, and incisional hernia. The advantage of the Ochsner method was said to be that operation was undertaken when the infection was localised and the risk minimal. Its drawbacks were that if the infection did not become limited the patient might be in a worse state than before; extra work and strain were thrown on all concerned; treatment must be carried out on the threshold of the theatre by the surgeon himself; and delay with mistaken diagnosis might be fatal. There was a great deal of truth in these criticisms, but they were of varying weight.

Mr. Cope said he was doubtful whether statistics could solve the problem of which was the better method, and he thought there was need of a thorough investigation into the whole question of appendicitis mortality by a responsible and impartial body. From his clinical experience, in spite of the comparative and average success of prompt operation, he had from time to time had cases in which delay had seemed to be the better plan. He still always advised immediate operation, not only for the unperforated appendix but also for perforative appendicitis with diffuse peritonitis, so long as the patient was not too toxic and was reacting well to the inflammation. The cases which he decided upon their merits were those with a definite and circumscribed lump and those with advanced peritonitis. If he thought the lump represented a subsiding inflammation with perhaps a small, ill-defined abscess, he sometimes tried the starvation treatment of Ochsner. If he thought there was a well-defined abscess, he usually opened it. With advanced peritonitis and a toxic and dehydrated patient it was better to wait a few hours and sometimes a day or two while the patient was hydrated and detoxicated by intravenous and rectal saline. It would be a retrograde step to teach that delay was the usual correct treatment. Delay should not be practised except by experienced surgeons.

Mr. Cope described his own technique and, in conclusion, recommended that whenever possible an experienced surgeon should be in charge of any case of appendicitis.

EXPECTANT TREATMENT

Mr. R. J. MCNEILL LOVE said that in appendicitis that had become limited to the right iliac fossa or

pelvis immediate operation might be extremely difficult. Although a practised surgeon could remove the appendix with the minimum of disturbance, many cases fell into the hands of the less experienced, whose operative results were buried in the records of their hospitals. The main points of expectant treatment were the four "F's": Fowler's position, fomentation, the four-hourly chart, and fluids by the mouth in minimal quantities. He had never felt very happy about fluids by mouth, but preferred intravenous infusion for four or five days. If expectant treatment was adopted for the localised condition, the disease followed one of three courses. In about 65 per cent. of cases the infection subsided and swelling disappeared, and three months later the appendix was removed at a clean operation with negligible mortality. In 25 per cent. of cases an abscess formed, showing that infection had become limited and resistance increased. Expectant treatment could be still carried on, but it was wise to drain the abscess. In 10 per cent. of cases expectant treatment must be abandoned because of increase of pain, tenderness, rigidity, and fever. The surgeon was then faced with the necessity of operating on a more toxic patient. Expectant treatment had been criticised on the ground, among others, that it was impossible to gauge the condition of the appendix. Once localisation had occurred, the surgeon knew something much more important: the condition of the surrounding peritoneum, omentum, and bowel, which were all acting as a wall to the inflammation. Discharging wounds and fæcal fistulæ were more common after the immediate operation. In suitable cases the mortality following expectant treatment was about 3 per cent. less than that obtained from immediate operation by experienced surgeons. The clean operation three or four months after the acute condition had subsided could be performed safely by a surgeon of less experience.

THE STATISTICAL ASPECT

Mr. H. C. W. NUTTALL, speaking of the statistical aspect, said that with a mortality of 2·53 per cent. he considered that he still had something in hand. Two points of view had to be distinguished: that of the full-time surgeon and that of the general practitioner who did a certain amount of surgery. The latter might easily be taught to operate carefully; it was more difficult to teach him to watch the patient. House surgeons must be taught never to attempt to remove the appendix if there were any difficulty. Hyperæsthesia was of very little value in diagnosis, as it was present in 50 per cent. of cases. The most difficult cases were those in which the condition had been established for some time and the surgeon could not tell where the infection had started and where to make the incision. Mr. Nuttall would still advise operation if the appendix region were incriminated. Some patients suffered severely from thirst unless they were given water by the mouth; to do so made little difference to the abdomen if the drainage were adequate. In the vast majority of straightforward cases he did not drain, but he always drained for the slightest amount of hæmorrhage, for a blood-clot in an infected abdomen was very serious. He did not regard the diminution of mortality-rate by 3 or 4 per cent. by the expectant treatment as good enough; the immediate operation gave better results in the end over a large series of cases.

Mr. HUGH WHITELOCKE stated that at the Radcliffe Infirmary, Oxford, the staff delayed operation only in two or three cases a year, yet the figures had improved for two reasons: the introduction of continuous intravenous drip in severe toxic cases, and the careful suction of local peritonitis, particularly from the pelvis. He had rarely drained by a stab incision over the pubes. By inserting a tube drain to the base of the pouch of Douglas and by withdrawing it about half an inch every day with a slight rotation, almost any pelvic abscess could be satisfactorily drained through a lateral gridiron incision.

Mr. JULIAN TAYLOR adduced as a reason for the low mortality at University College Hospital that the honorary staff dealt with practically all appendix cases. If the surgeon were experienced, it did not matter which principle he followed. The general presumption of the exponents of delayed operation that patients died from the dissemination of infection from an abscess was quite wrong; this was the rarest possible occurrence.

Mr. G. H. COLT said that some drainage statistics which he and a colleague had compiled and shown to a professor of statistics had illustrated the danger of any but a lateral incision. The mortality from an appendix abscess was approximately 3 per cent., but from spreading peritonitis it rose to 80 per cent. at about the tenth day. When the appendix and the more local inflammation had been removed and the operator saw clear lymph pouring into the local focus, he should leave a tube in for a short time; otherwise the risk was less if no drain were used. The difficulty lay in deciding what and what not to leave.

Mr. W. E. TANNER remarked that in some cases where the appendix was bound down to the back of the abdominal wall and the cæcal end was healthy he had divided the cæcal end, invaginated the cæcum, pulled out the mucosa of the appendix, and inserted a drain; the patient was saved a second operation. When a very old patient had an appendix of this type a transfusion of 200 c.cm. of blood would promote local suppuration and the patient would get better. This was far superior to giving vast quantities of fluid intravenously.

Sir JAMES WALTON also considered that the important factor was not so much the method as the man who carried it out. The important thing was the teaching which the surgeon was to give to students. Every general practitioner was likely to regard himself as a skilled surgeon for the purpose of deciding on delay. The enormous improvement in results had been due to the fact that practitioners were learning to send cases up for early treatment. When an abscess was localised and well defined the surgeon should always operate, and the only question was whether the appendix should be removed. There were three factors: what the patient would stand, how difficult the appendix was to get out, and how quickly the individual surgeon could get it out.

Mr. J. E. H. ROBERTS agreed that a new body of statistics should be obtained from hospital surgeons. A form would have to be filled up when each case was seen and the treatment was planned, and the material would have to be submitted to a professional statistician. A clear exudate in the peritoneum did not necessarily mean general peritonitis but might be due to infection passing through the walls of an unruptured abscess. He could not believe that when there was a general infection of the peritoneum and the source of infection continued, it was not advisable to remove the rest of the appendix.

Prof. J. PATERSON ROSS considered that the main argument for delayed treatment arose when the abscess was diffuse in the peritoneal cavity. Even with a diffuse peritonitis he removed the appendix, just as he would remove a rusty nail from an infected knee-joint. After that, the Ochsner treatment was the right one.

REVIEWS AND NOTICES OF BOOKS

Gefäss erweiternde Stoffe der Gewebe

By J. H. GADDUM, Professor of Pharmacology at University College, London. With an introduction by H. H. DALE, Director of the National Institute for Medical Research, London. Leipzig: Georg Thieme. 1936. Pp. 200. R.M.18.

A LARGE number of pharmacologically active substances can be isolated from living tissues. Some of these, for instance the hormones, adrenaline, and pituitrin, are obtained from highly specialised cells and bring about an increase in vascular tone. Others may be prepared from a large variety of tissues and give rise to vasodilatation when injected into animals; it is with these substances that this monograph deals. Sir Henry Dale discusses their general nature and significance in an introductory chapter. Three are chemically well-defined substances of known constitution—namely, histamine, acetylcholine, and adenosine. The evidence is in favour of the view that histamine and acetylcholine, at least, exist in the cells in an inactive combination and are released when the cells are stimulated or damaged; after their release they tend to produce local rather than general effects. A short historical review is given, and it is interesting that these substances were well known chemically before their physiological significance was realised. Prof. Gaddum begins with a very useful section outlining the methods generally available for the study of vasodilators present in tissue fluids and extracts. Histamine, acetylcholine, and adenosine compounds are fully dealt with in separate chapters. A very useful section follows in which substances of unknown constitution present in extracts of various organs are discussed, such as the "heart hormone" of Haberlandt, Kraut and Frey's "kallikrein," and Gley and Kisthinios's "angioxyl." The evidence for the separate identity of these various substances is examined critically, and the information provided will be of particular interest to clinicians who are offered preparations containing such substances as their active principles. These earlier sections are likely to be used mainly for reference purposes; the later ones have a more general interest.

In recent years evidence has rapidly accumulated showing that the action of many nerves is brought about through the liberation of chemical substances at their endings, a conception which though not new had previously been based on scanty experimental data. Convincing evidence in favour of this view is given and the whole subject is fully reviewed. Sir Henry Dale has coined the term "cholinergic" for nerves in which acetylcholine or some closely related substance is the transmitter, and there is now evidence to show that probably all pre-ganglionic autonomic fibres and all post-ganglionic parasympathetic fibres are cholinergic, as are the motor nerves to striped muscle. "Adrenergic nerves," that is to say, nerves which act as if adrenaline or some related substance were produced when they are stimulated, are also dealt with in this section, although strictly they do not come under the general title of the monograph. In the final chapter recent additions to our knowledge of several topics of general interest are outlined, including local chemical mechanisms regulating the circulation, anaphylaxis, and traumatic shock.

An excellent bibliography is provided and a good index. The book is indispensable to those working on pharmacological or physiological problems, and contains much information of value to the physician (who can read German) interested in the fundamental bases of medicine.

Essentials of Cardiography

By H. B. RUSSELL, M.D., M.R.C.P. Lond., Medical Officer in Charge of the Cardiographic Departments at St. Thomas's and the Royal Masonic Hospitals. London: J. and A. Churchill Ltd. 1936. Pp. 82. 7*s.* 6*d.*

THIS small book contains the essentials of electrocardiography and of radiological examination of the heart (orthodiagraphy) presented in an elementary form for the use of students.

In the first section, the different types of normal and pathological electrocardiogram are portrayed and simply yet clearly described. With a few exceptions the illustrative records are quite good, but the deflections are unlabelled which is a serious defect in a book intended for students. The second section of the book, dealing with radiology, is elementary but not very accurate. Some of the illustrative orthodiagrams are crude and the interpretation given is in several instances open to question. The anatomical diagrams might have been better, and that of the first oblique position is incorrectly labelled. Enlargement of the left auricle is not described, though it is mentioned as affecting the left heart border. The value and importance of radiological examination of the heart exceeds that of electrocardiography to-day, and some account of the method is required by students. If this section of the book were improved and slightly expanded, it would fulfil this requirement.

Principles of Bacteriology

Sixth edition. By ARTHUR E. EISENBERG, A.B., M.D., Director of Laboratories, Sydenham Hospital, New York; Member, New York Pathological Society, New York; and MABEL F. HUNTLY, R.N., M.A., Director of Nursing, Wesson Memorial Hospital, Springfield, Massachusetts. With annotations and a section on Microbic Variations by F. E. COLIEN, M.S., Ph.D., Professor of Bacteriology, Vocational School, Milwaukee, Wisconsin. London: Henry Kimpton. 1935. Pp. 378. 12*s.*

THIS is an American work designed as an introduction to Bacteriology for Nurses. In this country it would be considered unsuitable for such a purpose as it is against our educational rule to demand so much in the way of theoretical knowledge from nurses, most of whom have had but scanty general scientific training to serve as a foundation. This book is not likely to arouse enthusiasm for the American system of instruction. We find, for example, descriptions of such uncommon diseases as coccidial granuloma and sprue (said to be due to monilia!), but the treatment of such interesting and important subjects as diphtheria or streptococcal disease is quite inadequate. What can a nurse profit by reading a few paragraphs on such highly uncertain subjects as local immunity, Rosenow's elective localisation or bacteriophage, not to speak of the side-chain theory, bacterial variation, or the technique of the Wassermann reaction? An unfortunate feature of the book is the form in which many of the questions are put; a statement has "T"

and "F" written in front of it with the instruction to circle the "T" if the statement is true, the "F" if it is false. Here are a few examples. "The gonococcus is a streptococcus," "Dr. W. H. Park is the head of the New York Board of Health Laboratories," "Drs. George F. and Gladys H. Dick found the cause of pneumonia to be a streptococcus." We know that nurses often have to do their reading when they are too tired for any mental effort, but this is surely going too far in "spoon-feeding." It might even dawn on the tired reader that if she answers sufficient questions and uses the throw of a coin to make her decisions she will be practically certain to score a comfortable 50 per cent. It is fair to say that as the book has reached a sixth edition it cannot have failed in the purpose for which it was intended.

Modern Sociologists

1. PARETO. By FRANZ BORKENAU. London: Chapman and Hall. 1936. Pp. 219. 6*s*.

2. TYLOR. By R. R. MARETT, M.A., D.Sc., LL.D., Rector of Exeter College, Oxford. Same publishers. 1936. Pp. 220. 6*s*.

THESE two volumes owe their production to recognition by the publishers of a growing interest in social science, and the result is the issue of a series of sociological studies under the general editorship of Prof. Morris Ginsberg, professor of sociology in the University of London, and Mr. Alexander Farquharson, general secretary of the Institute of Sociology of London. The books are not intended to serve only as students' text-books, but the selection of both authors and subjects has been made with a view to supplying a systematic introduction for any intelligent reader to the best of modern thinking about the social world in which we live and work.

1. Pareto, born in 1848, was of aristocratic Italian descent, but his father was for some years a refugee in France and the son began his education in Paris. The father was a Mazzinist but the son showed marked antagonism towards the family tradition. Pareto became an engineer and while quite young obtained a considerable position in his calling, but he was never able to make his opinions fit with his career. He was caught between a government which was not renouncing economic State intervention and the revolutionary Socialist party. His attacks on economic protection developed into attacks on the government, and his situation became impossible. Being a comparatively rich man he retired from public life, and by a fortunate accident secured a chair at the University of Lausanne, whence came a series of writings whose bitterness was due to his position between two incompatible attitudes, but whose teaching was none the less valuable. Pareto died when Fascism had been only a year in existence so that, although in many directions his views might have coincided with Fascism, there is hardly evidence strong enough to justify the claim of the Fascists that Pareto was their chief precursor. Dr. Borkenau's closely explanatory description of Pareto's teaching will be welcomed by students of sociology.

2. Edward Tylor was a Quaker and was taken away from school too young to make it likely that he would develop into a scholar in the narrow sense of the word. In the widest sense he became a pre-eminent scholar, for admittedly his studies in anthropology made him the most learned man of his day over the vast field implied, though evidence forthcoming during the 20 years since he died would have extended his outlook and might have modified some of his theories. His studies originated in a happy and accidental meeting in Cuba with the famous ethnologist Henry Christy. They travelled through Mexico together and Tylor's first book, "Anahuac," records their experiences. In 1860 he showed himself the learned anthropologist that he already was, in a volume entitled the "Early History of Mankind," published in 1865; here he proved the width and importance of his studies, and when in 1871 the classic work "Primitive Culture" appeared he became celebrated, gaining election as an F.R.S. while still under 30, and shortly afterwards the D.C.L. Oxf. Prof. Marett's exposition of Tylor's work makes good and valuable reading. Such chapters as those on Society and on Material Culture show how great a man Tylor was and the important directions in which he was a pioneer, and the chapter setting out the connexion of religion and animism explains a direction of Tylor's researches with which his name is especially associated. This is a really useful little book.

A Doctor's Odyssey

A Sentimental Record of Le Roy Crummer: Physician, Author, Bibliophile, Artist in Living, 1872–1934. By A. GAYLORD BEAMAN. London: Humphrey Milford, Oxford University Press. 1935. Pp. 340. 11*s*. 6*d*.

THIS is an intimate picture of a man who had a large number of medical friends and connexions and deserved his position and popularity. Physician, book-collector and virtuoso, traveller, artistic critic, and gourmet, he touched life at many angles and always received and communicated impressions. The author describes the biography as "a sentimental record" and plays Boswell to his Johnson with admiration and without criticism. The chapter describing in detail the collection of books which Dr. Crummer made includes interesting notes on his activities as a collector and repeats his amusing little estimates of characteristics of both the shop and the shopkeeper at the various marts which he visited. The Crummer collection is now in the possession of the University of Michigan and will there remain a memorial of a very interesting personality.

Quarterly Journal of Medicine

THE January issue contains the following papers:—

Erythrocyte Sedimentation-rate in Diseases of the Heart, by PAUL WOOD (see p. 271).

Observations on the Treatment of Myasthenia Gravis.—A. M. COOKE and R. PASSMORE give the results of the use of various therapeutic measures on myasthenia gravis in a girl of 13 years. They found that glycine, acetylcholine, and Parathormone produced no clinical improvement, whereas Prostigmin by injection led to complete relief of symptoms for four hours, while eserine and ephedrine by the mouth gave a lesser but much more prolonged improvement. They also studied the creatine and creatinine metabolism in this patient and formed the opinion that the biochemical lesion is not an inability to form creatine from its precursors but rather an inability to metabolise creatine properly.

Glycogen Disease (von Gierke's Disease) by R. W. B. ELLIS and W. W. PAYNE.—This paper is illustrated by a detailed account of seven cases. The familial incidence of many of them is demonstrated and it is suggested that the condition may possibly be inherited as a Mendelian recessive character.

Two Cases of Muscular Degeneration Occurring in Late Adult Life.—S. NEVIN reviews the recorded cases of late progressive muscular dystrophy. Pathological and biochemical examinations of the affected muscles obtained at biopsy were made on these two cases, and changes were demonstrated differing at least in degree from those characteristic of progressive muscular dystrophy.

Achrestic Anæmia.—M. C. G. ISRÄELS and J. F. WILKINSON give an account of a group of cases of megalocytic anæmia which do not fit into the categories so far described; closely resembling pernicious anæmia, but differing from it, especially in course, prognosis, and treatment. This class of anæmias they term "achrestic" because they seem to represent a failure to utilise the anti-anæmic principle. The distinguishing characteristics are shown to be a megalocytic anæmia, the presence of free HCl in the gastric juice, failure to respond properly to anti-anæmia therapy, megaloblastic hyperplasia of the bone-marrow, and a prolonged course, eventually fatal.

Leucocytosis in Typed Lobar Pneumonia.—JOHN FLEMING reports observations on the leucocyte count in pneumonia on a series of cases in which the special type of pneumococcus concerned has been determined. He is able to show that during the first three days of illness a leucocytosis of over 20,000 is characteristic of most cases of Type I. lobar pneumonia, while a leucocytosis of less than 20,000 is usually found in Type II. pneumonia; further, that the leucocyte count is of prognostic value when the type of organism, the age of the patient, and the duration of the illness are all considered.

Gargoylism.—R. W. B. ELLIS, W. SHELDON, and N. B. CAPON describe a syndrome characterised by bone changes, a peculiar facies, congenital clouding of the corneal, abdominal distension with enlargement of the liver, spleen, and mental deficiency. They report in detail seven cases personally observed, and review ten cases from the literature.

British Journal of Surgery

THE January issue (Vol. XXIII., No. 91) contains the following papers:—

Spondylitis Ankylopoietica, by F. CAMPBELL GOLDING (London). An account of the radiological findings in 91 cases. Early joint and muscle pains occurred in the majority; the opinion was reached that sacro-iliac disease antedated by several years the spinal changes.

An Improved Technique for the Introduction of Radium Needles in the Treatment of Carcinoma of the Breast, by R. BROOKE (Chichester). The radium needles are contained in hollow trocars passed through the breast substance and fixed at each end in a rigid frame.

Further Observations on the Disturbance of Metabolism Caused by Injury, with particular reference to the dietary requirements of fracture cases, by D. P. CUTHBERTSON (Glasgow). A diet rich in first-class protein and of high caloric value appeared largely to mitigate the drain on the body nitrogen.

Œsophagectomy for Carcinoma of the Thoracic Œsophagus, by E. S. J. KING (Melbourne). Report of a successful operation by the transpleural route; preliminary gastrostomy and artificial pneumothorax had been performed.

Gastric Diverticula, with report of a case before and after operation, by G. A. EWART and G. R. MATHER CORDINER (London). Clinically there is no characteristic picture, and the operation is difficult. The X ray diagnosis is discussed in detail.

A Method of Treating Fractures of the Lower Limb: Use of a Combined Counterpoise and Traction System with a Thomas Leg Splint and Hinged Knee-piece Attachment, by A. LEWER ALLEN (Johannesburg). The splint is so suspended that it is used as a finely balanced, first-class lever, the site of fracture and the fulcrum coinciding.

Renal Rickets and Dwarfism: A Pituitary Disease, by BRUCE CHOWN (Winnipeg). In two cases described the association of dwarfism, polyuria, and urinary tract dilatation suggest a pituitary-diencephalic lesion. Such a lesion was found in the second case. The nephritis is regarded as secondary to an abnormal mineral metabolism.

Isolated Dislocation of the Base of the Fifth Metacarpal, by NORMAN ROBERTS and C. THURSTAN HOLLAND (Liverpool). Forward and inward dislocation (three cases reported) is easily reducible by traction, but requires prolonged extension. Outward dislocation into the palm (one case) may require open operation.

Rupture of the Long Head of the Biceps Brachialis, with notes on four cases, by H. A. H. HARRIS (Chelmsford). Two cases were successfully treated by suture of the long head of the biceps to the coracoid process of the scapula.

Progressive Post-operative Cutaneous Gangrene, by H. T. COX (Manchester). A case is reported which showed extensive sloughing and a definite zone of black gangrene. Histologically the process was limited to the true skin. Operation was successful.

Intravenous Pyelography in a Series of Cases after Transplantation of the Ureters, by G. GREY TURNER (London) and J. H. SAINT (Newcastle). Investigation in six cases showed satisfactory renal function in five; in one only was there impairment on both sides, and that was partial. The action of the whole colon as a urinary reservoir was demonstrated.

A Gridiron Access to the Biliary Apparatus, by C. JENNINGS MARSHALL (London). An external rectus incision is carried down to the posterior layer of the rectus sheath and through the posterior lamina of the internal oblique aponeurosis. The transversalis is divided by transverse incision.

Mucoid Carcinoma of the Cæcum in a Boy of 13 Years, by ROBERTSON F. OGILVIE (Edinburgh). The diagnosis at operation was tuberculosis of the cæcum. Death occurred by generalised metastasis.

Anterior Dislocation of the Hip, by J. A. MACFARLANE (Toronto). Open operation was required in a case of suprapubic dislocation, although attempts at manipulative reduction were made immediately after the accident.

Calcified Cyst of the Pericardium, by A. DICKSON WRIGHT (London). A hæmatoma, caused by a blow with a hockey-ball, became encapsuled and calcified. Successful removal is reported.

A Chloride-secreting Papilloma of the Gall-bladder. A Tumour of Heterotopic Intestinal Epithelium: with a critical review of papilloma of the gall-bladder, by A. B. KERR and A. C. LENDRUM (Glasgow). Cholecystostomy was followed by such excessive chloride loss as to prove fatal.

The Treatment of Acute Mammary Abscess by Incision and by Aspiration, by R. J. V. BATTLE and G. N. BAILEY (London). A method is described of treatment by repeated aspiration and washing out with Dakin's solution. The indications for this method and for incision are discussed in five types of breast abscess.

The Influence of Œstrogenic Compounds in Causing Hernia and Descent of the Testis in Mice, by HAROLD BURROWS (London). Œstrone has been found to inhibit or prevent descent of the testis. Scrotal herniæ are induced by every potent œstrogenic compound, but only in the presence of a mature or nearly mature testis.

An Experimental Method of Providing a Collateral Circulation to the Heart, by LAURENCE O'SHAUGHNESSY (London). A pedicled omental graft has been applied to the surface of the heart, the experiments being carried out in 14 cats and 2 dogs.

There is an account of a visit to the surgical clinic of the St. Vincent's Hospital, Melbourne; and also reports on cases of special interest and rarity.

AN INTERESTING AMALGAMATION.—A notice appears in the current *Riforma Medica* announcing an amalgamation for subscription purposes of the three Italian medical journals, *Il Policlinico*, *La Riforma Medica*, and *La Minerva Medica*. The communication points out that such a conjunction offers to the medical profession the opportunity of keeping in touch with all professional activities in much more convenient circumstances through the medium of the three great magazines. The combined subscription to the three journals is 150 Lire in Italy, and the subscription can be sent to the managers of any of the three papers; it can be made in two sums of 75 Lire each, the first of which is due now, the second instalment falling due on June 30th. Subscribers to the three periodicals will not only receive the journals at this reduced price, but will be allowed a discount of 10 per cent. on all the publications of the journalistic group P.R.M. It is suggested that by placing the subscribers in a position to estimate the progress of medical literature in a very convenient manner they will reap advantage, while the journals will be able to realise through the union a valuable conjunction of work and influence and stability.

THE LANCET

LONDON: SATURDAY, FEBRUARY 1, 1936

PHYSICAL STANDARDS IN INDUSTRY

IN his opening address on Jan. 24th to the newly formed Association of Industrial Medical Officers Sir DAVID MUNRO remarked how difficult it had been since the war to obtain systematic data about the physical condition and state of health of any large groups. The report by National Service medical boards upon the physical examination of 2½ million men of military age in 1918 had given rise to alarm at the time, but statistical criticism had since shown that except for youths of 18 the examinees could not be regarded as a representative sample of the nation's manhood. But that census did show a mass of remediable defects among those of an age to start on an industrial career; and recent rejections of recruits for the Army and Air Force told the same story. At the head of the causes for rejection stood such items as loss and decay of teeth, deformities of feet, defects of vision and hearing—in particular middle-ear disease—and heart trouble, many of them remediable defects. Prof. E. P. CATHCART'S investigation for the Industrial Health Research Board included measurements of height, weight, and strength in men representative of every section of the working community, but it had not been found possible to correlate these measurements with the disabilities causing rejection, although again there was no question of the magnitude of the remediable defects. Bearing all this in mind, Sir DAVID went on to suggest that medical officers in whole-time employment with industrial firms were probably better placed than any other scientific men or administrators for getting information about physical fitness or unfitness. What he would like to see was some system of setting out essential data of physique and disabilities found on entry and of recording them on some kind of agreed form, so that the data collected would be comparable firm by firm. It should also, he hoped, be possible to keep a record of the numbers rejected and of the causes of rejection, which would throw light on the known gaps in our existing health services. He would also like to see the data of physical states at entry and causes for rejection, followed by a comparison of those who are successful in industry, entered on these standards, with an unsuccessful group. If a medical record of sickness could be kept for every one of the personnel followed up, it would surely throw much more light than we have at present on the causes, incidence, and prevalence of occupational disease; and here again the entries should be on an agreed form comparable between one firm and another, for the key to advance in knowledge of occupational disabilities is accurate diagnosis. What he was suggesting was in fact a piece of combined research in which the Research Board could assist. The first step towards such collaboration would be for medical officers to send to the Board such records as they now keep; with the aid of expert medical statisticians it should then be possible to see what can be made of existing systems and what is required for coördinating further information. Sir DAVID MUNRO touched on the difficulty, well known to the Research Board, that operatives are shy of medical examinations. These objections on the part of the worker (to quote the introduction to one of the Board's annual reports) are easy enough to understand and are due partly to the spectre of unemployment which is always before his eyes and partly to there being many things about medical examinations, as he has experienced them, which offend his sense of fair play. To both of these factors is due a suspicion that, if the slightest physical defect is shown in the examination, it will be recorded against his name, and should the management have anything against him it will serve as an excuse to get rid of him; for he must know that physical unfitness is often an excuse for dismissal. Sir DAVID was hopeful that the Association would be able to collect the information without exciting prejudice. What he had in mind was strictly a piece of research. There was no intention of making an official collection of sickness statistics in rivalry with those of the Ministry of Health and the General Register Office.

RADIOLOGY IN RELATION TO OBSTETRICS

ALTHOUGH in the past few years, as the result of improvements in apparatus and the development of new techniques, the place of radiography in the study of the pregnant woman has been generally realised in continental countries and in America, obstetricians in this country have not availed themselves of radiographic facilities to the same extent. At combined sections of the Royal Society of Medicine, where the subject was discussed last week, Prof. FLETCHER SHAW divided the blame between the obstetrician and the radiologist; while the one had been slow in utilising radiological methods, the other had been slow in developing the technique. It would now appear that the obstetrician is at last becoming cognisant of the great help he may receive from X ray examination of his patients; introducing the discussion Prof. D. DOUGAL said that in every maternity hospital it was essential to have a radiological department equipped and staffed for diagnosis and research. It is to be hoped that this standard will now be generally accepted, sight not being lost of the fact that X ray examination is supplementary to but does not supplant thorough clinical examination. Further, in order that the utmost may be obtained from his work, the radiologist should be in full possession of clinical data about the patient, since in all radiological investigations it is by correlation of the clinical and radiological evidence that the ultimate diagnosis is reached. In addition, if antenatal radiography is to advance, the radiologist should

be informed of all pertinent events subsequent to his examination; from a consideration of these he will learn what modification in technique may be required to get even better results. In the early months of pregnancy a positive diagnosis may be established by radiography at the sixteenth week; by this time the vertebral bodies and the vertex of the skull are ossified sufficiently to cast characteristic shadows. It is perhaps not too much to hope that further refinement in technique may demonstrate fœtal parts as early as the twelfth week. The Aschheim-Zondek test is positive much earlier than this, but the demonstration of fœtal parts is incontestable.

Radiographic pelvimetry has proved its value; with radiograms taken under standard conditions it is possible by a simple calculation to determine the diameters of the pelvis. Measurements should be made as early as possible before the uterine contents obscure the definition. At the same time as the pelvic diameters are ascertained it will be possible to exclude deformities of the pelvic inlet, whether due to congenital abnormalities, skeletal dystrophies, or local bone disease. The information thus gained may lead the obstetrician to anticipate difficulties which might be encountered when labour commences. As gestation advances radiography is of help in determining multiple fœtuses, in recognising abnormalities of the fœtus, and in estimating the maturity of the fœtus more accurately than can be done by calculation from the date of the last menstrual period. Towards term the position and presentation can be shown on the film, information that is not always certain even when the clinical examination has been made under general anæsthesia. About the value of cephalometry or the mensuration of the fœtal head there is more difference of opinion; during labour it is the bony pelvis which is rigid, whereas the fœtal head is capable of alteration in its diameters. But Dr. L. N. REECE is confident that cephalometry may be used to fix the last moment at which the head will pass through the birth canal. In the diagnosis of placenta prævia two radiographic methods are available. In the first the amniotic fluid is rendered radio-opaque by the injection of a medium like Uroselectan B when the placental site will be shown as a defect in the shadow of the amniotic fluid; this method, known as amniography, is not free from the risk of inducing premature labour and fœtal death. In the second method the bladder is filled with a solution of sodium iodide, when a central or marginal placenta prævia is revealed by an alteration in the position of the shadow of the fœtal head in relation to the superior outline of the bladder. In the diagnosis of pyelitis of pregnancy help may be had from intravenous urography in assessing the excretory power of the kidneys and the degree of enlargement of the renal pelves, their calyces, and the ureters; when the diagnosis has been made serial urograms may be used as a guide to treatment. Over and above all this, should the pregnant woman present signs or symptoms of intrathoracic mischief the radiologist should be called in.

It has been argued that antenatal radiography is unnecessary since the majority of labours terminate normally, but as Prof. DOUGAL remarked at the R.S.M. discussion this argument would apply just as much to clinical pelvimetry. And surely the early recognition of abnormalities, maternal and fœtal, will do something towards reducing mortality? The demonstration of multiple fœtuses will prepare the mother for unexpected additions to her household, while the demonstration of fœtal abnormalities will prepare the obstetrician for difficulties in the conduct of the labour and may in some instances lead to the induction of premature labour. Reckoned in terms of money, X ray examination looks expensive in comparison with other methods of investigation; but its routine use would soon bring down the cost considerably, and complications avoided should be entered on the credit side.

AN ELOQUENT GOOD-BYE

A FEW days ago Lord HORDER marked the end of his term as physician to St. Bartholomew's Hospital by addressing his colleagues at the hospital and the students in a farewell address. The address, with which the issue of THE LANCET opened last week, is an able review of the situation of clinical medicine, in which the author traces in wise and witty terms the main reasons for its present position, and closes by pointing shrewdly to a place where the clinical training of students might well be and could easily be bettered.

The orator testified to being a personal witness in his own time of three great advances in the science and art of clinical medicine which have rendered the doctor of greater service to the patient. That he would mention two of these advances would be immediately guessed, for it is plain how immeasurably, whether in the field of the internal physician or in that of the surgeon, precision of diagnosis and treatment has been gained through radiology; and equally plain is it that the correlation of laboratory methods with ward work has brought about similar enlightenment to the physician of the day that was denied to an older generation. But to the wisdom and skill of that older generation Lord HORDER paid tribute when he pointed out that, although deprived of the opportunities for more accurate knowledge enjoyed by their successors, they were able to meet difficult situations often in an astonishingly pertinent manner through cultivated powers of observation. Consultation of obituary notices of our forefathers will show how often they had impressed their contemporaries by their apparently intuitive knowledge; apparently they guessed, for it might happen that the surmise turned out to be correct when its author could not supply hard-and-fast reasons, but really they were deducing their view from things detected by their sharpened senses, though unrevealed to those less fortunately endowed. The other factor to which Lord HORDER attributed the main progress in clinical medicine is relevant here. It is the increased frequency of and greater thoroughness in post-mortem examinations. "The clinician,"

he says, "began to think morbid-anatomically." That is exactly what the old observer was doing, though he had not the same chances which his modern example enjoys of ascertaining in the dead-house whether his solution of the cross-tissue lights had been correct. It is clear from older medical literature that great importance was attached by many physicians to the lessons of post-mortem pathology, but the facilities for learning the lessons of the post-mortem room were even in times comparatively recent very scanty at many institutions. It is a notable advance in clinical medicine that the better opportunities should be more generally utilised.

Particular attention may be drawn to Lord HORDER'S suggestion that in one place the medical education of the senior student could be definitely improved to the saving of his time, and the advance of his appreciation of clinical work. His actual words are:

> The fundus oculi and the membrana tympani are normal anatomical structures, yet few clinical clerks have ever seen them before they enter the wards and, largely as the result of this fact, some have not seen them clearly even when they leave. We could profitably exchange the time spent over theories of colour vision and the intimate structure of the organ of Corti for these important matters. The blood-cells are a part of normal histology, but they have rarely been counted, or, if they have, it has only been during the demonstration of the Thoma-Zeiss pipette. The contours of the abdomen, the reflexes and tendon-jerks, the normal gait, the surface markings of the lungs, the deposits that may occur in urine apart from disease, the flora of the fæces in health . . . is it really economical that the time of the clinicians—and of the senior clinicians—should be taken up in teaching about these things?

Similar observations have been made by the orator himself and by others in the recent discussions of the medical curriculum. And in the many places in which practical reform has lately taken place no doubt the criticism has been met, but it is a point which all teachers in all schools might well remember. While abstaining almost wholly from reference to himself in his eloquent farewell words, Lord HORDER, we may be certain, is here alluding to a situation in medical training, the effect of which he has often felt personally. To a great teacher nothing is more baulking than to find that the lessons which he is striving to convey are rendered of little use to his audience by their lack of fundamental knowledge, and all the members of hospital staffs will remember to have been hampered in their educational work in this manner. Also many a man, looking back on his career as a student, will wish that he had been made to lay down as part of his regular routine that foundation for work which later he was compelled to construct, as best he could, beneath an erection already to some extent elaborated. Lord HORDER'S words are very timely.

ANNOTATIONS

WHAT'S HIS NAME?

IT is in keeping with current tendencies in medical psychology that disorders of memory are chiefly regarded from the standpoint of emotional interference. Where a memory has been lost or falsely recalled, it is in such mechanisms as repression that we are apt to seek the explanation, unless concussion or some other crude damage is to blame. Engrams and biological memory do not preoccupy us as they did the readers of Semon, although the ancestral memory of Jung and the organic mneme of Rignano are not far removed from Semon's conceptions. Among non-medical psychologists to-day there are some who have studied the development of memory in young children; but there are few, medical or otherwise, who have investigated how this function behaves during the later life of a normal person. To read psycho-analysts, one might suppose that a man would have every experience from the cradle to the analytic hour available to memory, if only the appropriate conditions for its recall could be analytically brought about; to read the psychiatrists, one might suppose that between the extremes of arterio-sclerotic or senile dementia on the one hand, and the boasted mental vigour of a Cornaro on the other, there is no change in the powers of memory that one may look for among men who had reached or passed middle life, no failure that comports with the slow physical changes that betoken age without presaging decay. Yet we all know, in ourselves or our intimates, how insensibly the recalling of names and dates becomes less prompt and easy as the fifties pass into the sixties. It has been pointed out that such a falling-off may be compatible with continuously productive mental work within an accustomed sphere, though unexpected demands upon the memory, or emotional disturbance, will be likely to accentuate the affection. It is perhaps significant that some elderly writers on these topics have said that the function of memory is in a certain regard inversely proportional to intelligence; people with exceptionally good memories produce nothing new because they do not "work over," and unconsciously modify, their material as less gifted people do. Hence, thought Kraepelin, the few hours of sleep that these fellows of prodigious memory usually require; they do not have to use sleep for working over their memories, as the rest of us must. Forel declared that forgetting is one of the conditions of intelligence. Against these partial views may be set the words of Pascal, a man as phenomenal in memory as in intelligence, who wrote (Pensées, Article XXV., 14): "La mémoire est nécessaire pour tous les opérations de l'esprit." Certain it is, that to be unable to recall at need is a provoking experience to those who have been accustomed to find their memories loyal and prompt. The order of these lapses is unclear. Although for the grosser defections, Ribot's law of regression may suffice, the much commoner elusiveness of names must be brought under some other rule. Bleuler,[1] unrepentant apostle of associationism, would have it that substantives go first, and especially concrete ones, because in them the word is less important than in the case of verbs and conjunctions and other indications of a relationship; for the mental representation of the concept "Jackson" or "table" the word is

[1] Bleuler, P. E.: Naturgeschichte der Seele. Perlin: Julius Springer. 1932.

scarcely necessary, the image of the object sufficing, whereas in the case of abstract images the word supplies the simplest and clearest component which can easily release definite associations or can itself be stirred readily from without into activity. Bleuler's treatment of the matter raises issues that can scarcely be studied without regard to the verbal and nominal losses in aphasia—and to begin to discuss aphasia is to open the floodgates, if not to plunge into the bottomless whirlpool.

ROUTINE EXAMINATION OF MILK FOR TUBERCLE BACILLI

WHEN milk is to be tested by guinea-pig inoculation for the presence of tubercle bacilli the technique adopted must depend on a compromise between accuracy and expense. A single guinea-pig is liable to die prematurely, and if there are very few bacilli in the milk they may not produce lesions in every animal. An attempt has therefore been made by Mattick and White [1] to estimate the increase in efficiency obtained by inoculating two guinea-pigs per sample in place of one. Their findings are based on examination of 4775 samples, of which approximately 3100 were bulk samples while the rest came from individual cows. From the results it is calculated that if 1000 bulk samples were tested by inoculation of a single guinea-pig 84 reinvestigations would be needed because of premature death whilst 62 positive samples would be falsely reported as negative. If two guinea-pigs were used instead of one, only seven reinvestigations would be needed because of the premature death of both animals, and only four false negative results would be returned. These figures make very clear the advantage of using two experimental animals for every sample. Another question concerns the actual technique. In the present investigation the deposit from 75 c.cm. of milk, centrifuged for 20 minutes at 3000 r.p.m., was emulsified in 5 c.cm. of saline and divided between two guinea-pigs. It may be asked why the test should not be made more sensitive by inoculating each animal with all the deposit from 75 c.cm. of milk; this would not add much to the expense of the test though it would of course increase the labour of centrifugation. Mattick and White do not comment on this point, but there are two obvious objections to the use of large quantities of milk. First, by doubling the strength of the inoculum, the amount of extraneous matter, other than tubercle bacilli, is doubled and the chance of intercurrent infection thus increased; for the observations recorded show that the amount of dirt in the inoculum influences the probability of premature death. Secondly, the problem of transit of samples may make it difficult or even impossible to obtain large quantities of milk. Against these objections must be weighed the undeniable advantage of increasing the concentration of tubercle bacilli by doubling the volume of milk tested. In the present experiments each pair of guinea-pigs was kept in a single cage and out of the 9550 which were inoculated about 10 per cent. died prematurely. This figure, which agrees with those given by other workers, might well be lowered if only one animal was kept in each cage, but the extra attention and accommodation required might neutralise the economy.

It is noteworthy that in Mattick and White's inquiry only 13 per cent. of samples taken from cows suspected, on clinical grounds, of suffering from tuberculous mastitis proved to be excreting tubercle bacilli in the milk. Superficially this figure reflects upon the value of the routine clinical examination of udders for suspicion of tuberculosis. But it must be remembered that tuberculosis is only one of several common causes of chronic mastitis and the symptoms of tuberculous mastitis are by no means characteristic. In all cases of doubt a sample must be sent in for laboratory examination and this may well account for the low proportion of positive returns.

[1] Mattick, A. T. R., and White, P.: Med. Officer, Dec. 28th, 1935, p. 265.

RECURRENT PAROTID SWELLING

MUCH attention has lately been paid to recurrent swelling of the parotid gland, partly in the hope of elucidating its pathology and partly to show that it differs from epidemic parotitis. The newer methods of investigation, such as sialography, and the examination of catheter specimens of parotid saliva, have thrown some light on the condition, but the various investigators have naturally tended to emphasise different aspects of the problem, and their data are not always comparable.

The diagnosis is used to cover all cases of periodical or recurrent enlargements of the parotid, irrespective of the frequency or duration of the attacks or the underlying lesion. In 19 such cases studied by Payne,[1] no fewer than 16 of the patients were women, the average age at onset being 29, and the average duration of symptoms nine years. As a whole, the group showed nervous instability, and there were wide variations in their attacks. Characteristic changes were found in the saliva, which was always infected (most commonly with *Streptococcus viridans*) and sialography demonstrated equally characteristic changes in the ducts, strongly resembling those of bronchiectasis. Similar cases have been recorded by Pyrah,[2] and more recently Pearson [3] has described a series of 17 cases, 13 of them in children under twelve. This series differs from those previously described not only in age-incidence, but also in the preponderance of males and the rapidity of appearance and disappearance of the swelling in many of the children. Pearson divides his cases into non-infected and infected, but it is not clear whether bacteriological culture of the saliva was carried out in all of them. Sialography in both groups showed changes like those recorded by Payne. In a large proportion of the cases there were associated symptoms attributable to allergy (e.g., asthma, hay-fever, or urticaria), and the saliva of one patient during the attacks contained plugs packed with eosinophils. In this connexion the report of Meyer [4] of a familial history is interesting; his patient, the mother, and the great grandmother had all suffered from recurrent parotid enlargement.

From the practical point of view, two facts are especially important. The first is that many of the cases are diagnosed and treated as mumps, or as recurrent mumps, though it is doubtful whether there is ever a second attack of mumps. Secondly, it is noteworthy that gross suppuration is rare, although the local condition may be disconcerting, and the immediate prognosis is therefore good. The separation of these cases from recurrent swelling of the parotid due to calculi should not be difficult, but swellings of the same kind have been recorded in toxic conditions such as lead-poisoning or in association with the use of iodine or mercury. Similarly,

[1] Payne, R. T.: THE LANCET, 1933, i., 348.
[2] Pyrah, L. N.: Brit. Jour. Surg., 1933, xx., 508.
[3] Pearson, R. S. B.: Arch. Dis. Childhood, October, 1935, p. 363.
[4] Meyer, H. S.: Jour. of Pædiat., 1934, iv., 248.

they should be readily differentiated from the occupational enlargements of the parotids seen in glass-blowers and players of wind instruments and occasionally in malingerers, for in these the swellings are pneumatoceles. For the rest it must be admitted that no uniform explanation is applicable to the groups of cases now being considered. The rapid development of the parotid swellings in early life and their frequent association with allergic symptoms are striking features, as is also the observation that in adults they are associated with emotional instability. As seen on X ray examination the changes in the ducts are alike in children and adults. Whether the primary obstruction is allergic, spasmodic, or catarrhal is uncertain, but once it has developed, it is followed by dilatation and sooner or later by infection. In childhood it may be found that the attacks cease with the elimination of certain articles of food from the diet, with the clearing-up of buccal infection or with simple massage of the parotid gland. In adults the same methods may be successful, but where organic changes are more advanced, slitting and dilatation of the duct, auriculo-temporal avulsion, and X ray treatment may all give better results.

PHYSIOLOGICAL CHANGES DURING PUBERTY

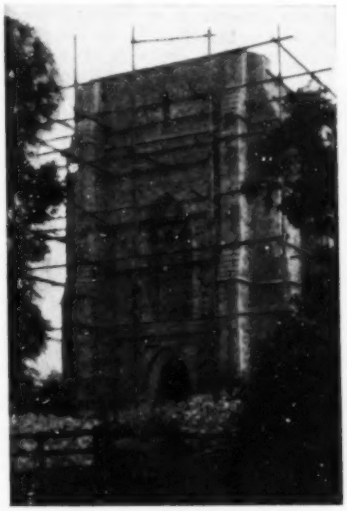
ALTHOUGH much statistical information is available concerning growth in the years of puberty, it is mostly based on the study of large groups of children at different age-periods. Thus it has been shown that about two years before puberty begins there is a slowing in vertical growth, followed by a rapid increase during several subsequent years, girls being taller than boys. The maximum increase in weight occurs slightly later than the maximum increase in height. Of the signs of puberty in girls, breast development is usually the first, and it is followed by rounding of the hips and the appearance of pubic and axillary hair, in that order. As a rule menstruation is the last, or almost the last, sign, becoming established when breast development is nearly complete.

Thinking in terms of the individual rather than the age-group Dr. Gustav Nylin [1] has made an intensive study of 12 girls in the four years during which the onset of puberty might be expected. They were inmates of the State Institute for the Blind at Tomleboda, and were most of them suffering from congenital eye defects, but they were chosen because their physical and psychical status was otherwise as nearly as possible normal. Conditions of examination were standardised. In all but one subject the maximum growth in height was found to correspond with the commencement of puberty, though the age at which this occurred varied considerably (from 9·8 years to 14 years, with an average of 11·8). The duration of this maximum height increase varied from 471 to 884 days, and in most cases breast development was complete when growth ceased. As breast development was found to be the first sign of puberty, there therefore appeared to be a close relationship between breast development and height increase. The thyroid also seemed to increase in size during the same period, but as the means of measuring its growth were not accurate, little emphasis can be laid on this impression. Nylin also found that the height-increase declined when menstruation began. The arteriovenous oxygen difference under standard conditions proved singularly constant during growth, from which he concludes that the blood flow is a direct function of standard metabolism, since the latter was observed to increase considerably during the period of maximum growth. The pulse-rate fell throughout the period of study, and showed no signs of rising with the onset of puberty; but there was a rise in both systolic and diastolic blood pressure during the period of development. The vital capacity also increased during development, though its increase became manifest later than the other functional changes.

[1] Physiology of the Circulation during Puberty. Acta Med. Scand., Suppl. lxix., 1935, p. 77.

THE WILLIAM HARVEY MEMORIAL

WE wish to impress earnestly upon our readers the situation of the Harvey Memorial Fund instituted some time back with the object of rebuilding the fallen tower of Hempstead Church, Essex. Our readers have been kept informed of this movement and must sincerely hope with us that it will soon come to a satisfactory conclusion, for the delay has been regretted by many, though strenuous efforts have so far failed to abbreviate it. The present position is that the work of restoration, which so far has been exceedingly well carried out, has proceeded, and about two-thirds of the structure has been restored; but the fund is now exhausted and progress has ceased. The last third of the work, which includes the rehanging of the bells, remains to be dealt with, and a sum of approximately £2000 is yet required for the termination of the undertaking. Lord Horder has become chairman of the committee in the place of the late Sir John Rose Bradford, and all donations should be made payable to the Harvey Memorial Fund and sent to Dr. G. de Bec Turtle, Royal College of Physicians, Pall Mall East, London, S.W.1.



AN ANTISTREPTOCOCCAL AGENT

INTEREST has lately been aroused by the claims of German workers to have synthesised a chemotherapeutic compound efficient against streptococcal infections. This substance, which has been named Prontosil, when given either subcutaneously or by the mouth, protected mice against a lethal dose of streptococci injected into the peritoneal cavity. Whereas in untreated animals there were enormous numbers of cocci in the peritoneal exudate, in those treated with prontosil the organisms were few and mainly undergoing phagocytosis. The drug has no appreciable bactericidal action in vitro, and the mechanism by which it acts in the body was therefore obscure. At a discussion in London last autumn [1]

[1] THE LANCET, 1935, i., 840.

it emerged that English workers had been able to confirm the original claims only in part; a longer survival in experimentally treated mice was common, but ultimate recovery, so far from being the rule, was rather the exception. This difference was apparently attributable to the properties of the streptococci used, those in the favourable German experiments being derived directly from human sources, whereas in England the strains employed had been submitted to repeated mouse passage, with a consequent increase in virulence for mice. The still more recent findings of C. Levaditi and A. Vaisman,[2] who used non-passaged strains, indicate a striking therapeutic effect, but one to which there were exceptions in every series of animals; with whatever dosage, either of the drug or of culture, 100 per cent. survival was never obtained. These investigators also report experiments designed to ascertain how the drug acts. On the possibly inadequate ground that reticulo-endothelial "blockage" does not interfere with the therapeutic action of prontosil, they conclude that its effect is not secured by any sort of stimulation of the defence mechanism. On the other hand, they have come to the conclusion that it acts by preventing capsule-formation, and so rendering the streptococcus susceptible to phagocytosis. This plausible idea is supported only by the observation that the drug is ineffective when the inoculum consists of (capsulated) streptococci derived directly from the peritoneal cavity of another mouse. The hypothesis may very well be true, but it perhaps requires verification by other means. Meanwhile the therapeutic utility of this drug needs to be studied further in the clinical field, though the temptation to its indiscriminate employment should be resisted. Levaditi and Vaisman have shown by experiment that prontosil is without influence on a number of other bacterial and virus infections, and the original clinical results reported from Germany indicate that it is of value only in infection by *Streptococcus pyogenes*. Its use should evidently be restricted to cases of this infection.

RECONSTITUTION OF DURHAM UNIVERSITY

THE Commissioners appointed under the University of Durham Act, 1935, have drawn up a first draft of statutes for the reconstitution of Durham University. Under the new constitution the Newcastle College of Medicine and Armstrong College will cease to exist as separate corporations and be merged in University College, Newcastle-upon-Tyne. The council of University College will consist of the principal, the dean of medicine, six and twelve members to be appointed in the first instance by the existing councils of the College of Medicine and of Armstrong College respectively, six members to be appointed by the academic board of University College, four members by the Newcastle City Council, two members by the Northumberland County Council, two members by the house committee of the Royal Victoria Infirmary, one member by the committee of management of Newcastle-upon-Tyne Dental Hospital, two members representative of other associated hospitals, and, if the council so determine, two coöpted members. None of the members appointed by the existing council of the College of Medicine shall be full-time teachers and not more than two shall be part-time teachers in University College. The council will appoint a dean of medicine for a period not exceeding five years who shall be responsible—under the authority of the council, the academic board, and the principal—for guiding the organisation and development of medical education and research and for maintaining close relations between University College and the associated hospitals. All matters relating to the organisation of medical education and research shall be referred in the first instance to a medical studies committee of the academic board. As soon as possible after the appointed day a temporary Newcastle council will be formed which will forthwith appoint a dean of medicine who shall thereupon become a member of the temporary council in place of the existing dean of the board of the faculty of medicine. As soon as this appointment has been made the temporary council will provisionally determine, without any report from the academic board, what holders of academic posts shall be members of this board. The Commissioners are ready to receive and consider any representations made to them before April 1st, 1936. Such representations should be sent to the secretary to the Commissioners, 3, Sanctuary Buildings, Great Smith-street, London, S.W. 1.

ACTION OF AMYL NITRITE

THE inhalation of amyl nitrite as a treatment for angina pectoris was introduced by Lauder Brunton in 1867. He tried it because he knew that venesection diminished the severity of the attacks of pain and it seemed to him that amyl nitrite, a drug already known to diminish vascular tension, should act similarly. The striking relief which it afforded was related by him to the fall of blood pressure produced by the drug with consequent relief to the heart. This, the most apparent explanation, received almost universal assent and is still held by some clinicians. It is only of recent years that the view has been attacked as inadequate, but the cumulative evidence against it as a complete explanation is now considerable.

Five years ago Lewis,[1] investigating a series of cases of angina pectoris associated with high blood pressure, found that amyl nitrite would often give relief without conspicuous change in the blood pressure, and concluded that the effects of the drug were not to be ascribed to simple lowering of the pressure but were "in part, if not in chief part, due to dilatation of the coronary vessels." Studies on the relationship of blood-pressure changes to the disappearance of pain in angina of effort after the inhalation of amyl nitrite have led to similar conclusions.[2] That amyl nitrite dilates the coronary vessels in animals is certain; but the fall in systemic blood pressure tends to reduce the flow of blood and this effect might well lead to a reduction in the total blood-flow through the coronary arteries. Actual measurements in the intact animal have given conflicting results, although the balance of evidence is in favour of an increase in the total blood-flow. The importance of further evidence in man is therefore apparent.

It is now widely believed that alterations in the electrocardiogram similar to those seen in coronary thrombosis may occur when there is a relative ischæmia of the cardiac muscle. Nitroglycerin has been shown by Scherf and Schnabel[3] to prevent, or diminish the degree of, this alteration in attacks of angina pectoris, and Evans and Hoyle[4] have demonstrated improvement in abnormal electrocardiograms after amyl nitrite. Nagl[5] has recently

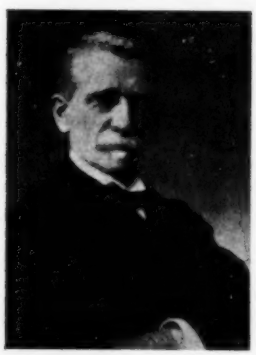
[2] Presse méd., Dec. 25th, 1935, p. 2095.

[1] Lewis, T.: Heart, 1931, xv., 305.
[2] Wayne, E. J., and Laplace, L. B.: Clin. Sci., 1933, i., 103.
[3] Scherf, D., and Schnabel, P.: Klin. Woch., 1934, ii., 1397.
[4] Evans, W., and Hoyle, C.: THE LANCET, 1933, i., 1109.
[5] Nagl, F.: Wien. klin. Woch., 1935, xlviii., 1543.

recorded simultaneously the effect of amyl nitrite on the electrocardiogram, arterial and venous blood pressures, and heart-rate of normal persons. Alterations in the T wave of the electrocardiogram were brought about which are interpreted as due to a temporary relative cardiac ischæmia. It is believed that this can be accounted for by the rise in the heart-rate which increases the work of the heart at the same time as the coronary flow is reduced by the fall in blood pressure. Nagl suggests, therefore, that amyl nitrite should not be used in cases of angina pectoris with a tendency to tachycardia. It is known that its inhalation may rarely increase the severity of anginal pain [6] or even induce an attack,[2] and changes such as Nagl describes may well be the cause. But in practice it is impossible to foretell which patients will respond well and which badly to amyl nitrite and actual trial in an attack is the only test. It is worth noting that patients who suffer from the relatively mild pain of angina of effort usually prefer to take nitroglycerin, while amyl nitrite is best reserved for the long-lasting "spontaneous" attacks in which it gives the spectacular relief on which its reputation rests.

ETTORE MARCHIAFAVA

THE death of Prof. Marchiafava in Rome has been overshadowed by war, but the passing of so great a figure in international medicine should not be forgotten because he had outlived his contemporaries. Ettore Marchiafava was born in Rome on Jan. 3rd, 1847, and he died there on Oct. 25th, 1935. He took his degree in medicine in 1871, was nominated next year assistant in the university department of pathological anatomy, and succeeded to the chair in 1883 when Tommasi-Crudeli was transferred to the chair of hygiene. During his 40 years as professor of pathological anatomy Marchiafava made many important contributions to medical knowledge. This was a time of renaissance in Italian medicine, in which he bore a distinguished part. He was a great teacher; his lectures on pathological anatomy made the dead live again to his hearers as he recalled the history, the symptoms and physical signs, and summed up their relation to post-mortem findings. But outside Italy Marchiafava's fame is based upon his observations on malaria. As early as 1879 he maintained that melanin was derived from the destruction of the hæmoglobin of the red corpuscles, and he went on to interpret correctly the early stages of development of the malarial parasite. With Celli he demonstrated the development of the parasite in the red corpuscle, the amœboid movement, and the production of melanin. In 1889 he and Bignami discovered the parasite of æstivo-autumnal or subtertian fever, and in 1892 they described the character of the pernicious forms. He was also able to differentiate the quartan from the benign tertian parasite. Marchiafava's interest in pathology never ceased, and in his ninth decade he was still to be found at work in the Institute of Pathological Anatomy.



[6] Wood, F. C., and Wolferth, C. C.: Arch. Internal Med., 1931, xlvii., 339.

RED CELL SEDIMENTATION IN HEART DISEASE

THE value of the erythrocyte sedimentation-rate as an indication of active disease has been demonstrated in rheumatic carditis, and also in syphilitic aortitis, thyrotoxicosis, and hypertensive heart disease. In the January issue of the *Quarterly Journal of Medicine* Paul Wood gives the results of sedimentation tests done on 164 cases of all types of heart disease and heart failure, excluding cases with any form of intercurrent infection or with a secondary anæmia as shown by a red cell count of under 4 million or a hæmoglobin under 70 per cent. As controls he has used 19 patients with cardiac neuroses. He finds that congestive heart failure retards the sedimentation-rate regardless of the cardiac pathology and therefore masks evidence of active disease. Increased sedimentation-rates are found in active rheumatic heart disease, myocardial infarction, and syphilitic aortitis; the result in this last condition may help in the distinction between an aortic valvular disease due to syphilis, rheumatism, or athero-sclerosis. Again, the sedimentation-rate may enable one to distinguish between coronary thrombosis, angina of rest, and angina of effort, since in cases of coronary thrombosis the rate is not immediately increased, but after a day or two increases steadily to a maximum, till about the end of the third week, after which it slowly returns to normal. Angina of effort, on the other hand, shows a normal sedimentation-rate, and angina of rest, in the absence of syphilitic aortitis, gives a slightly to moderately increased rate which does not change materially from week to week.

THE ENDOCRINE ORGANS AND INSANITY

"We believe that it cannot be successfully denied that the *corpus* of present day psychiatric literature conveys, and is intended to convey, the idea that the endocrine pattern is a significant and important causal factor in the etiology of those abnormalities of behavior that are collectively subsumed under the term 'insanity.' But where is there precise *proof*, in the truly scientific sense, that this is so?"

HAVING put this question to themselves, and finding no satisfactory answer, Raymond Pearl, Marjorie Gooch, and Walter Freeman set about the task of seeing whether a statistical study of the weights of the endocrine organs in a group of the insane would provide any information from which conclusions could be drawn. Their study,[1] most carefully and laboriously carried out, deals with 1307 insane persons dying in hospital and examined *post mortem* by Freeman. Each individual was placed, according to the preponderance of clinical evidence, into one of four broad groups—namely, cycloids, paranoids, schizoids, and epileptoids. This material, as the authors point out, has serious limitations; it relates wholly to a mentally diseased population, and standards of comparison from normal persons can be taken only from the very heterogeneous materials available in the literature. Secondly, the progress of the patient to death may well have changed the biologically normal weight relations of the parts. Imperfect as the data are, they should, however, be capable of revealing any pronounced differences between what the authors term the endocrine pattern of the psychiatric disease types.

[1] Human Biology, 1935, vii., 350 and 555.

In fact the analysis shows no striking or orderly difference in the weights of the various organs in the four groups. If, for instance, aberrations of thyroid structure and function are significant factors in the ætiology of different types of psychoses, this fact is not reflected in any definite manner in the weight of the organ, so far as the present data indicate. On the other hand, the quantitative pattern of the endocrine system as a whole, as indicated by organ weights, does appear to differ between the insane and the most reliable "norms" that the authors have been able to discover. This difference concerns not so much the total mass of all the endocrine organs taken together as a whole, in proportion to body size, but the *pattern* of the system—the proportionate quantitative contribution of the several organs to the total. Judging by this comparison, the insane are deficient relatively in thyroid tissue but oversupplied relatively with parathyroid, thymic, and adrenal tissue. They show only a generally small and probably insignificant relative excess of pituitary and pineal tissue and a small relative deficiency of testicular or ovarian tissue.

The authors with becoming caution conclude, therefore, from their elaborate study that the pattern of the endocrine system as a whole *may* really differ significantly between the mentally diseased and the not-mentally diseased, but to prove this will require more evidence, and evidence of a different character, than they have been able to present. Until that evidence is available they suggest that vague generalisations about the importance of the endocrine glands in insanity are premature.

A CAUSE OF ULCERATIVE COLITIS ?

CHRONIC ulcerative colitis is sometimes regarded as a sequel to bacillary dysentery and sometimes improves under treatment with antidysenteric serum. Bargen attributes it to a specific diplo-streptococcus; others have put forward the claims of certain anaerobic bacteria. None of its "causes," however, has yet been generally accepted and attention must therefore be paid to the evidence put forward by Dack and his fellow-workers[1] in Chicago. Believing that no satisfactory growth of a delicate and deep-seated organism is likely to be obtained in ordinary cultures of fæces—or indeed from scrapings of ulcers seen directly with proctoscope or sigmoidoscope where the contents of the upper bowel are continually pouring over the ulcerated area—they have investigated 3 cases of chronic ulcerative colitis in which symptoms and radiographic and proctoscopic examinations were characteristic of the severe form of the disease, and in which the affected colon had been completely isolated following an end ileostomy. Numerous observations of these cases led to the recovery from the colon of Gram-negative pleomorphic non-sporulating rods extremely sensitive to oxygen and difficult to subculture. The same organism was isolated by appropriate methods from the non-isolated colon in 7 out of 12 additional cases of non-specific chronic ulcerative colitis and in 2 cases of specific (amœbic) ulcerative colitis. Complement-fixing antibodies were found in the serum of 14 out of 16 cases of typical chronic ulcerative colitis, but in only 3 of 16 control patients. In several cases complete fixation was obtained with a serum dilution of 1 in 10. The organism in question seems to resemble very closely the bovine *Bacillus necrophorus* which produces severe septic processes in a number of domestic animals. This organism may invade any tissue and produces various necrotic foci—e.g., calf-diphtheria, necrotic ulcers of the intestine in hog-cholera, metastatic necrosis of liver and lungs of cattle and swine, and necrotic stomatitis of calves, lambs, and pigs.

[1] Dack, G. M., Dragstedt, L. R., and Heinz, T. E.: Jour. Amer. Med. Assoc., Jan. 4th, 1936, p. 7.

MILK BY FOUR DIFFERENT NAMES

FROM April 1st of this year there will be four grades of milk instead of the five on sale at present. The draft Milk (Special Designations) Order, 1936, does not employ exactly the nomenclature forecast in our leading article of July 6th last, but the scheme is substantially the same, with its advantages and disadvantages. In future there will be two grades of fresh milk, called Tuberculin-tested and Accredited; also two grades which have been treated by heat, called Pasteurised and Certified (Pasteurised). The last-mentioned is tuberculin-tested milk which has been pasteurised, and it will therefore be the cleanest and safest of the four grades, having a bacterial content of not more than 30,000 bacteria per c.cm. (compared with 100,000 in pasteurised). The present top grade, Certified, which is bottled on the farm and contains no more than 30,000 organisms, is abolished. Tuberculin-tested and accredited milks will closely resemble the present Grade A (T.T.) and Grade A respectively; but after the end of this year the requirement that they shall contain no more than 200,000 bacteria per c.cm. before delivery to the consumer will be replaced by a methylene-blue reduction test. Everyone will be glad that the name "Grade A" should give way to a more non-committal description, and it is an advantage that the "accredited" herds should be inspected quarterly instead of every six months. But whatever its name, this type of milk cannot—as we said in July—be recommended by the medical profession for consumption in the raw state.

Under the new Order the Ministry of Health will no longer grant licences to producers of tuberculin-tested milks. All the licences will henceforward be issued by local authorities.

OWING to the death of King GEORGE it has been decided not to hold the Hunterian festival dinner of the Royal College of Surgeons on Feb. 14th, but the Hunterian oration will be delivered at 4 P.M. on that day by Mr. C. H. Fagge as arranged. The ball of the St. George's Hospital medical school on Feb. 19th has been cancelled, and the dinner of the Royal Society of Medicine on the same day has been postponed. Prof. Edward Mellanby's lecture, on Jan. 31st to the Royal Institution, on Recent Advances in the Treatment of Disease has also been postponed.

INDEX TO "THE LANCET," VOL. II., 1935

THE Index and Title-page to Vol. II., 1935, which was completed with the issue of Dec. 28th, is now ready. A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXXXVI.—PROGNOSIS IN ASTHMA

IT is generally held that asthma does not appear unless there is a hereditary predisposition, and as this predisposition is inherent and permanent it is impossible to speak of a cure for asthma. On the other hand, we have reason to believe from the study of pedigrees and from the results of skin tests on apparently normal individuals that the asthmatic tendency may remain latent throughout life, and we know that many patients lose their asthma for long periods of time.

Little is known about the factors which determine the latency or manifestation of asthma. Some physicians of experience do not share the prevalent enthusiasm over modern methods of treatment, and believe that we are no better able to control the disease than were physicians of a generation ago, though we are better equipped than they to relieve its symptoms. Asthma is a variable illness, and while we must often sympathise with the patient in his relapses, we can also congratulate him on his remissions. It is understandable that these remissions should be attributed to the treatment, rather than to that waywardness of the disease which we consider responsible for the relapses, and every therapeutic novelty is for a time regarded as a cure for asthma—vaccines, endocrines, allergens, X rays and irradiation, ketogenic diet, gold, liver, artificial fever, and sympathectomy. Attacks of asthma, like attacks of peptic ulceration or acute rheumatism, tend to recover spontaneously, and of patients seeking medical advice for asthma some 50 per cent. may be expected to improve without specific treatment. With few exceptions no treatment precludes the likelihood of relapse in a few months or years, and though it is possible to distinguish those who are likely to do well from those who are likely to do badly, it is rarely wise to predict complete cessation of the paroxysms. For all this, I believe that the outlook for the asthmatic patient to-day is better than it was thirty years ago.

In what follows I shall assume the orthodox treatment of asthma. The paroxysms are relieved by antispasmodics such as adrenaline and ephedrine. Between the attacks attention is paid to the hygiene of life, the avoidance of overloading of the stomach or colon, the minimisation of contact with animal and vegetable dusts. Psychological stimuli are removed and respiratory exercises are carried out regularly. Septic foci and nasal abnormalities are treated with the utmost conservatism. When there is bronchitis an autogenous vaccine from the sputum is used, and if the patient is clearly sensitive to common inhalants such as pollen or orris root the attempt is made to desensitise him.

The questions that arise in prognosis are (*a*) risk of death in a paroxysm; (*b*) prospect of immediate improvement; (*c*) prospect of permanent recovery; (*d*) effect of the disease on the general health and duration of life.

Death in or following a Paroxysm.—It is sometimes suggested that asthma is more annoying than dangerous, and that it has little influence on the duration of life. It is true that death during a paroxysm is unusual. It is nevertheless not so unusual as is taught, and whenever a patient passes into the status asthmaticus or has persistent dyspnœa for more than one or two days the risk of sudden death should be seriously considered. Experience of a large clinic at which several hundred patients are in regular attendance suggests that one or two of these patients may be expected to die of asthma every year. Death may result from the immediate effects of the paroxysm, from heart failure, or from pneumonia. I believe that pneumonia is usually initiated by patchy or more massive collapse of the lungs induced by excessive secretion of mucus and bronchospasm, and it may be followed by pleurisy and empyema. A rarer sequel of the paroxysm is spontaneous pneumothorax, which is usually more alarming than dangerous. I have also seen cerebral hæmorrhage in a young woman.

Prospects of Immediate Improvement.—With modern treatment about 20 per cent. of patients are completely relieved of their asthma for some years; between 15 and 20 per cent. are absolutely resistant to treatment, while the remainder are more or less improved though still subject to attacks. In other words, between 66 and 75 per cent. of cases are significantly improved. Failure to improve may be due to incomplete investigation and treatment, or to ignorance and lack of coöperation on the part of the patient. The patient may know the cause of his asthma but is unable to avoid it and desensitisation proves unsuccessful. The ability to spend one's childhood at a public school on the south coast rather than in an overcrowded tenement in Hoxton, to winter in Switzerland, or to undergo a long and expensive course of desensitisation, is naturally an important element in prognosis. Favourable features are early age of the patient, brief duration of the asthma, and infrequent attacks. The popular belief that children "grow out" of asthma probably exaggerates the frequency of spontaneous recovery and should not be allowed to encourage neglect of treatment. A seasonal incidence and sensitisation to a single inhalant such as pollen, to which the patient can be specifically desensitised, are of good prognostic omen. Allergic complications such as hay-fever, rhinorrhœa, eczema, and migraine are of no moment, and, indeed, in so far as they stress the importance of protein hypersensitiveness, are of good augury. Nasal disease, respiratory complications (such as bronchitis, emphysema, and pulmonary fibrosis), and hyperpiesia mitigate strongly against lasting improvement. The chronic nasal patient, shorn of turbinates, wheezing and whistling through his antrostomies, is as big a bugbear to the physician as is the chronic abdominal patient, and he is as little amenable to treatment. As already indicated, the chances of improvement are inversely proportional to the age, and while the duration of the asthma is less significant than the age of the patient, it is unusual for a patient who has had asthma for more than 20 years to gain real freedom from the disease.

The Prospect of Permanent Recovery.—What happens to patients who are for a time completely relieved of their asthma? Unfortunately many of them relapse, and within five years nearly half of them are having asthma again. It is probable that the longer the remission the smaller the likelihood of relapse, but it is quite common for patients to relapse after being free for ten or more years. Remissions of this kind occur most frequently between the ages of 15 and 30,

and it is not unusual for adults coming for treatment to give a history of asthma in childhood which disappeared at puberty and has only reappeared after many years. In such cases it is usually a new and different stimulus which is evoking the asthma—in Rackemann's simile the gun remains loaded and a new trigger is firing the attack. Once more improvement should follow appropriate treatment, an improvement which in chastened mood we shall now describe as relief rather than cure.

Effect of Disease on General Health and Duration of Life.—The risk to life is greater in patients over 40, more especially when the asthma did not develop till adult life; in those whose attacks are frequent and difficult to relieve by symptomatic remedies; and in cases accompanied by atheroma, hyperpiesia, or emphysema. The family history is more often negative and protein hypersensitiveness is more often absent in fatal cases than in the average asthmatic. On the other hand, extreme protein hypersensitiveness is not unduly dangerous except in so far as acute anaphylaxis may result from the parenteral introduction of the protein in skin testing or in attempted desensitisation. In patients under 40 with mild and occasional asthma the mortality is probably not more than 25 per cent. above the standard figures. In patients over 40 with frequent and severe paroxysms the mortality is two or three times the standard value, the excess of deaths being due to heart disease and pneumonia.

Apart from respiratory and cardiovascular complications asthmatics are a healthy race, perhaps less liable than their fellows to infectious illnesses. They are bad subjects for operation or for acute respiratory disease, but have the compensation that an operation or a febrile illness is often followed by a relatively long period of freedom from asthma. The distress induced by a hearty meal induces many of them to maintain their nutrition at a subnormal level, but this doubtless has its advantages as well as its drawbacks. They are intelligent and courageous, and while psychological factors play an important part in their illness it is unwise to regard an asthmatic as neurotic in the derogatory sense or he will confute you by dying in an attack. If the physician cannot cure the malady the patient can nevertheless learn to manage it and live with it, and he should be encouraged to live as full a life as possible. Occupations which entail arduous physical exertion or exposure to dust are unsuitable, but with these exceptions the asthmatic should be encouraged to look forward to a career on an equal footing with his fellows.

L. J. WITTS, M.D., F.R.C.P.,
Professor of Medicine in the University of London at St. Bartholomew's Hospital Medical School.

SPECIAL ARTICLES

MENTAL HEALTH

TROUBLES OF ADULTS AND CHILDREN

THE fourth biennial conference of the National Council for Mental Hygiene was held at the Central Hall, Westminster, from Jan. 23rd to 25th. At the opening session the chair was taken by Mr. W. F. Roch, vice-president, and a discussion on Mental Hygiene and International Relations was opened by Lord ALLEN OF HURTWOOD, who said he believed that the psychological factor would increasingly determine the question of war or peace. Almost for the first time in history the exercise of imaginative will-power could now give the victory to peace, notwithstanding the causes of war that still remained. There was now no physical reason why anyone in any part of the world should be hungry, ill-clad, or ill-housed, or why nations should fight for their livelihood. There was now a mechanism, in the League of Nations, whereby men could make effective over the world of nature that mastery which science had placed in their hands. Men's minds, however, seemed to be still inadequate and the problem was one deserving the consideration of those interested in mental hygiene. Mental adjustment and control were essential to counterbalance the accumulated fund of tradition and behaviour which caused every nation to work off its unsocial passions on its neighbours. The evils of the Treaty of Versailles might have been due very largely to life in an ill-ventilated nursery ruled over by a tired nurse and visited by a preoccupied father and a too-loving mother. The citizen must cease to make his children in his own image. Dr. WILLIAM BROWN read the paper published on p. 290, and a brief discussion followed.

At the first session on Friday morning the chair was taken by Dr. Arthur MacNalty, and the subject of discussion was the Organisation and Correlation of Mental Health Services in Local Areas. The opening speakers were Prof. R. M. F. Picken, Miss Evelyn Fox, and Dr. T. S. Good. In the afternoon, under the chairmanship of Mrs. E. M. Hubback, Dr. Helen Boyle, Mrs. Neville Rolfe, and Mr. Claud Mullins opened a discussion on Problems of Marriage and the Establishment of Courts of Domestic Relations. Eloquent appeals were made by magistrates and doctors alike for the establishment of special courts, imbued with the atmosphere of the consulting-room, to try to prevent the breaking-up of marriages which might be saved by modern psychological methods and the application of sympathy and common sense. Several speakers also urged extension of the divorce law for cases where there was no possibility of successful treatment.

In the evening the Bishop of Southwark took the chair, and a discussion on the Priest and the Doctor in the Treatment of Nervous and Mental Disorders was opened by Dr. H. CRICHTON-MILLER. Nervous and mental disorders, he said, did not arise from simple causes, and it was in the field of multiple causation that the coöperation of priest and doctor was most often justified. It was essential to guard against the facile acceptance of a single explanation which, more than anything, led to partial and ineffective treatment. The adjustment of a personality to, for example, a persistent neuralgic pain should be the concern both of doctor and priest. The three great sources of maladjustment were fear, guilt, and inferiority, and in each of these, and particularly in the second, the priest had a part to play. The problem for discussion was: "How far does equanimity count in promoting and maintaining health, and what measure of equanimity can be secured by the representative of organised religion?" Just as science was broader than the practice of medicine, so religion was broader than the function of the priest.

Canon T. W. PYM expressed the difficulty of the priest who was certain that his penitent was nervously ill when the general practitioner called it overwork

or indigestion and dismissed the matter. The temptation to unprofessional psychiatry was very great Even when the patient was put in the hands of the right doctor the priest's business was by no means over. For the rebuilding of the religious section of the mind after the psycho-analytic breaking-down the religious expert was needed. Probably very much could be done by ministers of religion to prevent the onset of a nervous or mental disease if only the clergy could obtain some reliable instruction.

Mr. Z. F. WILLIS regretted a tendency to water down Christian essentials in order to establish a respectable concordat with science. He outlined the contributions which the priest could make to psychotherapy, emphasising his value in convalescence.

On Saturday the subject of the three sessions was

Education for Living

In the morning the period before the age of eight was discussed, in the afternoon that from eight to fourteen, and in the evening that from fourteen onwards. The chair at the first session was taken by the Rev. A. W. Harrison.

THE NURSERY

Dr. R. G. GORDON outlined the problems of the infant, and the seeds that might be sown in the early months of life. The relationship of the child to the parents should be an equilateral triangle; divided loyalties were reflected in the growing child by a sense of bewilderment or an attempt to play off one parent against the other. Recent work had thrown a good deal of light on eidetic imagery: an imagery so vivid that it could not be distinguished from reality. About 50 per cent. of children experienced it, but it always faded soon after puberty. A child might be accused of lying when he was really merely describing such images, and if they were really alarming they might have a serious effect on the child's development. Frightening experiences, whether real or imaginary, produced a feeling of insecurity in respect of his environment, while sexual experiences or images produced a sense of guilt or insecurity.

Dr. MARIA MONTESSORI described the process of the child's growth and said that all living creatures in the early stages went through sensitive periods. The young caterpillar found the tender shoots at the tip of the branch as the result of his extreme sensitivity to light, and lost that sensitivity as soon as he was capable of absorbing other nourishment. By means of temporary sensibility of this kind each characteristic was fixed and stabilised. The child's purpose was totally different from that of the adult. He did not scrub a table to get it clean but to scrub until he had mastered scrubbing. The child who had been thwarted in one of his sensitive periods had lost for ever that particular chance of natural growth. Such thwarting might provoke violent reactions with no apparent cause. It was therefore essential to investigate the causes of naughtiness and capricious behaviour. The adult knew the child as he was in disease but had no knowledge of the healthy child because, like all other undiscovered forces of the universe, he was outside the adult's experience.

Miss J. A. CALLARD (vice-chairman, Welsh committee, National Union of Teachers) said there was no reason why the nursery and infant stages should not be regarded as a whole, and the primary consideration at this period was the incessant care for the physical well-being of the child, and regard for the cultivation of desirable habit and deportment. The more formal aspects of instruction would not be emphasised, but continuous progress would be made in knowledge and expression by methods which invoked in aid of education the pleasurable activities natural to children. As a result of modern training, teachers were both qualified and anxious to undertake this work. There was a crying need for more and better provision for the younger children of this country. The pre-school child had suffered hitherto an avoidable neglect. The open-air principle was particularly desirable for the younger children, and a garden was invaluable. Miss Callard pleaded for the use of the opportunities already available; hundreds of classrooms in infant schools were unoccupied, and their adaptation would be less costly than building nursery schools. There was no reason for the creation of a gulf between schools for those under five and for those over five, and the amenities of a nursery school should be accessible after that age. Regular and nutritious meals were essential, as were also training in hygiene and cleanliness, and provision of bathing facilities and stretcher beds for the afternoon rest. There was a need for unification of administrative control.

In the afternoon the chair was taken by Dr. J. A. Glover, and Dr. EMANUEL MILLER spoke on

MOULDING THE MIND: EIGHT TO FOURTEEN

He looked with suspicion, he said, on any efforts to mould the mind, for the phrase implied preconceived ideas as to shape and a ready-made design for living. The major conflicts of life were faced and dealt with in the first five years, neurosis and character formation being the resultants; intelligence alone remained to develop. The ability to exercise curiosity, to make emotional contacts with schoolmates and teachers, depended on the degree of emotional freedom left after the years of early struggle. Before teachers set to work on the child between eight and fourteen they ought to be provided with such knowledge of his childhood as was put into the hands of physicians by the social worker of a child guidance clinic. It must be ascertained whether the child was tenderly mother-fixed or terrified by parental authority; whether he had latent anxiety or an obsessional disposition. The attempt to mould the mind must be made with knowledge of the material presented. The intellectual capacity and character must be studied and estimated. Special handling would be called for if there were lack of capacity to play in group games, inability to ask questions or excessive questioning, lack of curiosity about manual operations, excessive "goodness," indifference and shyness in social contacts, attitudes of renunciation, or repeated physical incapacity with trivial physical signs or absence of organic disease. Moulding should be designed to remove anxiety or obsession by active treatment, to obviate frustration by love, to afford outlets for aggression in the play group, to condone vulgarity, to organise the "gang spirit" by suitable group activities, to accept sympathetically the tendency to inverted sex interests by preparing for heterosexual enlightenment at puberty, to correct physical anomalies before puberty, and to cultivate manual and artistic aptitudes.

Miss M. WITHERS (headmistress, Dawson Junior Girls' School, Barking) said that nowadays children were not educated for their work but for their leisure. If they were to get the most out of life every side of their nature must have an opportunity to develop; there must be an inner harmony and balance not easily upset by the buffets of life. The school must see that each child was given ample opportunity for

self-expression. This, with the younger ones, came most naturally through painting, acting and rhythmic movement, but if these were to be continued successfully with older girls there must be a carefully planned progressive scheme. The objects of education could be helpfully discussed with nine- to ten-year-olds. Coöperation between home and school was very important, as parents were apt to be concerned primarily with the means of securing a job. When the early forms of self-expression ceased to interest, some kind of craft work was most likely to appeal. Nature study and elementary science were always attractive, and children took infinite delight in growing plants, animals, and the vagaries of the weather. The humanities were the most important of all subjects. Literature gave immense pleasure to children. Children should leave school with the belief that they were entering on a great heritage and that the infinite resources of knowledge were only waiting to be explored.

Miss F. HAWTREY (principal, Avery Hill Training College) said that her students were taught to aim at directing activities rather than at moulding the mind. It was easier to change theory than practice. Modern theory was enlightened, but the average class still contained 40–60 children, wedged in heavy dual desks between high windows, and formative experiences were almost impossible to attain. The child owned nothing but his own copybook; the figures he modelled must return to the common lump, and the well-thumbed text-books must go back to the school cupboard. Schoolrooms were dark and stuffy, and cold water alone ran into the small stained basins. The asphalt playground was as hideous as a prison yard. Moreover, there were still many teachers who had learned in a hard school and felt that they must teach in a hard school. Amidst these surroundings "education for living" must be practised. One of the most serious and insidious threats to freedom arose from the scholarship examination. A little girl of 5½ was said to have observed, "I shall have to get a move on; I have only 4½ more years to get my scholarship." Yet many thousands of teachers were now giving their lives to put the new theories into practice. Bare classrooms were filled with flowers. Flower-beds were made in playgrounds with soil and manure brought in paper bags. Opportunities were found for music, dancing, dramatic work, and painting. The Hadow recommendations would not become effective until suitable schools were provided; the reform of school buildings was an urgent question for education. Schools ought to be beautiful. Prof. Burt had said that the ideal school should be a wilderness playground with a shelter somewhere in it. Nowadays a child's natural exclamation on seeing a gull was, "Look, Mummy, it flies like an aeroplane!" The sum of one penny a day per child would be enough to ensure the future and enable the young "to draw good into themselves from all their surroundings."

THE FINISHED PRODUCT

The evening discussion on the adolescent was conducted under the chairmanship of Mr. Basil Yeaxlee. Mr. R. E. ROPER said that the educational ladder at this age was supposed to lead to higher things, but the trouble about a ladder was that so few people could use it at one time. The post-war increase which had filled the schools was now swelling the ranks of young labour. Into this mad medley were thrown those who had completed secondary school or university courses, slaving for a certificate or degree which would give a better chance of employment. The anxiety and competition inseparable from adult life to-day cast their shadows over the 8–14 group with a ruinous pre-selection from which infant schools were not wholly free. There was an increase in young adult tuberculosis and a rise also in the number of those certified as mentally defective, and in suicides and attempted suicides. The present chaos could be reduced to some order by raising the school-leaving age, with maintenance where necessary, by extending continued education and by improving school premises. The size of the classes must be reduced and education must be thought of in terms of the individual. All examinations before the last year should be abolished, and even this one should be combined with records of school life as a whole. Above all, anxiety must be removed from education. "Finished" too often meant "done for"; the educationist must see that it meant "perfect," so far as age permitted.

Miss G. HADOW (principal of the Society of Oxford Home-Students) declared that most of the girls who came to her from secondary schools were healthy minded and wholesome, but the exception always attracted the greater interest. There was no doubt that some girls felt the responsibility of being a prefect as something that was a strain, and reacted from it during their first year at college. A break between school and university would nearly always be beneficial, as for many people the change was too abrupt. This especially applied to day-girls, who were often miserably homesick when they first went to college. The difficulties in the way of this break were the loss to the school of a girl at a time when she was most useful, and the necessity of the scholarship. It would be a very good thing if the idea could be disposed of that university education was a mark of special distinction at which every intelligent girl should aim. The present tendency was to judge the worth of a school by the number of girls it sent to a university, and girls who were not really suitable were pushed into college life. Very few entrance candidates showed much evidence of thinking for themselves, and the general attack on and defence of all kinds of opinions encountered at the university were often a shock. One of the weaknesses in school training was lack of precision in thought and expression; there was no evidence of the present generation thinking more clearly or accurately than the last. Its interests, however, were world-wide, and the tone of Oxford was one of conscious responsibility as citizens. Young Oxford passionately desired to be just. The present generation had got over the tendency of the immediate post-war group to kick against every kind of restriction. Like every generation, they wanted experiment and adventure, but their sense of justice and citizenship stood out conspicuously.

Mr. G. A. LYWARD (director, The Clinic and School, Finchden Manor School, Tenterden) said that he proposed to speak about honesty but to call it teachability. He quoted a question presented to him recently by a group of 20 neurotic adolescents after a discussion on coöperation. "Doesn't it look," they said, "as if clear thinking is feeling?" There were two kinds of stealing in adult life: the open and direct, or the indirect dishonest way of, for example, telegraphist's cramp. Both types of thieving were apt to end in confinement: though one place of detention was called a prison and the other was not, both were but external indications of an already imprisoned condition. All of us started life in a prison of some kind, and those who had the care of us

from 0 to 14 helped us to pay off the original debt and enabled us to live like the kings of old, "of his own." Those who were neglected or indulged and so robbed of this capacity remained credit-seekers. They were not the joy-finders, for joy was born of pleasure and pain, success and failure. It did not come to those who lived to please mother. An adult might be defined as a person that had at last grown able to rely upon himself as teachable. The physically grown-up who were not adults in this sense were still fundamentalists and never clear thinkers. The unteachable group included those who were already neurotic at 14. They held on tenaciously to a variety of ideas and ideals which were dangerously different from what they could afford to feel about the same issues. They did not feel personally at all, having as it were numbed themselves against the pain of loss and failure. They were easy prey to the too good and the too bad around them.

The aim of the educationist must be to render teachable, to wean the babe from his delinquency, waywardness, or indebtedness, so that he could concentrate and consecrate body and mind to an ordered life and service which were increasingly free. From 14 onwards was the time when it was necessary to do what the baby could not do: to make distinctions. The whole question involved in differences had to be faced. Before 14 it was comparatively easy to shut one's eyes to differences. At 14 the thinking apparatus might work in either of two opposite ways: it could clarify or confuse and camouflage. It was a shame that the world so often fell to pieces for the child of 14. It would be a sign of grace if the public schools would open their eyes to the fact that a system in many ways desirable for the 14-year-old was not suited to the hundreds who went to public schools still at an emotional age of 3. The number of such would be considerably reduced if more preparatory schoolmasters would appreciate the value of real chaos plus security. Thousands of 14-year-olds were not at public schools but were leaving State schools for all kinds of occupations. At that age they were not so much teachable as suggestible, and when they could not stomach what they met they might either identify themselves with it so that they lost their play and became industrial personalities, or let themselves become machines in work and compensate by an equally mechanical pleasure-world.

All education should be organised with an eye to the danger and ease with which escape from life could be made. There should be more bureaux where adolescents could be saved if possible from drifting into jobs on motives which could not long remain adequate. Ways of escape from growing up might be found in all sorts of culture and even in the scholarship system. Curing was not so effective when the healer did not relate the child's emotional problems to his classroom difficulties, and the true task of the teacher everywhere was to discover the child through his classroom difficulties and vice versa. There were still many teachers as blind as their pupils to the fact that all subjects and all work revealed mind at its creative task of carrying life from the vine to the branches. The unphilosophical teacher was a dangerous teacher, afraid to teach to the feeling because he himself confused "feeling" with "feelings." Children must be so taught that they would expect to find differences within sameness, for in that lay their hope of ultimately finding a unity in the differences. Only such a person was truly honest, truly loving, truly human, and teachable.

MEDICINE AND THE LAW

Respite of Death Sentence after Medical Inquiry

REFERENCE was made under this heading last week to the case of R. *v.* Mortimer, the man who was found guilty of murder in that he had deliberately driven a motor-car so as to run down a woman on her bicycle. There had been a question of the admissibility of evidence of his having similarly driven a car at other women both before and after this particular occasion. The comment was ventured that the defence, having relied on disputing the identity of the motorist, had been debarred from raising the question of insanity. The case established conduct so abnormal that it seemed inevitable that the Home Office would intervene before execution of the sentence.

Hardly had this comment been made before it was officially announced that the Home Secretary, acting under Section 2 of the Criminal Lunatics Act, 1884, had caused a medical inquiry into Mortimer's state of mind, and, after considering the medical experts' report, had recommended the respite of the capital sentence. Thus Mortimer's punishment is nominally commuted to penal servitude for life, and he goes to a convict prison where he will be kept under medical observation. We see therefore how narrow the scope of a criminal trial must necessarily be. Mortimer's conduct was that of a madman, but the issue of his mental state (which must have been the dominant question for the average spectator at the trial) was excluded. In other words, the case illustrates the two different standards which the community applies at different stages of the administration of justice. To the judge and the jury at Winchester assizes, and to the Court of Criminal Appeal, Mortimer was 100 per cent. sane and was fit to be hanged; to the authority which carries out his sentence Mortimer was partially insane and unfit for the death penalty. Naturally the assize court was concerned with his mental state at the date of the offence, whereas the Home Office was concerned with it at the date of the medical examination after the trial; but it will probably not be asserted that Mortimer suddenly changed from sanity to insanity between the two dates. The difference of standard is clear. The criminal court would be concerned with the question whether the prisoner, at the time of the offence, was insane within the limits of the doctrine of criminal responsibility as laid down by the courts. The Home Office is concerned with the question of his insanity under the ordinary law whereby a man can be certified and removed to an asylum. The distinction was brought out by the Home Secretary in the House of Commons after Ronald True's case (Commons Debates, June, 1922, p. 210), and was carefully examined by the Atkin Committee on Insanity and Crime (see the report, Cmd. 2005, published in 1923); possible change in the law and practice of cases falling within Section 2 (4) of the Criminal Lunatics Act, 1884, was one of the questions specifically referred to the committee. There is an ancient legal repugnance to the execution of an insane criminal. Sir Edward Coke, for instance, observed that such a course would be "a miserable spectacle, both against law and of extreme inhumanity and cruelty, and can be no example to others." The repugnance is due to the two ideas that a man of unsound mind is barred from submitting some possible point in stay of execution, and that it is not Christian charity to send him into another world

when he is not of capacity to fit himself to meet his Maker.

Use of Inquest Depositions in Criminal Court

When a man and woman were charged, at Clerkenwell Police-court last week, with the murder of a woman who died after an alleged illegal operation, the prosecution put in the depositions taken at the inquest. Counsel for the male defendant objected, on the ground that, though the man had been called upon to give evidence on three occasions before the coroner, he had never been cautioned that what he said might be used in evidence against him. Counsel suggested that the accused had been severely cross-examined at the inquest which had in effect developed into an inquiry whether the witness had not been an accessory to the alleged illegal operation. Asked by the magistrate if he asserted that the inquest had been improperly conducted, counsel replied that he did not go quite so far, but he did complain that something not proper was done. The prosecution contended that it had been clearly laid down that the question of being cautioned was a point to be taken by the witness and was not for the coroner. This was possibly a reference to a case in which THE LANCET has a special interest, Wakley *v.* Cooke, where the judges supported the view that people should be allowed to make any statement they desire at an inquest and, while not bound to incriminate themselves, must look after their own interests in giving evidence. The prosecution at the Clerkenwell Police-court further referred to a dictum of Mr. Justice Swift that cases of alleged illegal operation would never be brought into court at all if witnesses were cautioned. The magistrate allowed the inquest depositions to be admitted. This course seems clear in view of Section 5 (3) of the Coroners Act, 1887, though doubts have arisen in the past over admitting a witness's deposition taken before a coroner where the accused was not present at the inquest.

Inquest on Death in Nottingham Nursing-home

The Nottingham inquest on Miss Ada Louisa Baguley, a cripple aged 50, who died in an unregistered nursing-home carried on by Nurse Waddingham and Mr. R. J. Sullivan, stands adjourned in view of the ill-health of an important witness. Pending its completion, it is not possible to comment on the important elements of the case and the light it throws on the safety of the system of certification before cremation. Reference may however be made to a point taken by the legal representatives of the proprietors of the nursing-home. Mr. William Smith, on their behalf, drew attention on Jan. 21st to the fact that the coroner had stated that Dr. Roche Lynch, the Home Office analyst, would be called at a later stage. Dr. Roche Lynch had already given evidence, and Mr. Smith expressed the fear that the calling of Dr. Roche Lynch a second time might have the effect of completely shattering any point which might have been made in favour of his clients. He considered he ought to have the assistance of an analyst of equal standing, if that were possible. The coroner replied that Dr. Roche Lynch was not in opposition to Mr. Smith or his client, but was present to help them all in the case.

The incident aptly illustrates the problem inherent in inquest procedure. It is the coroner's inquiry, held in the public interest. To him it is an investigation. On the other hand, to parties or witnesses possibly involved, the inquest, as it develops, may assume the nature of a trial. The coroner naturally wants all the help he can get, and will call and recall witnesses in his own discretion for that purpose. The legal representative of an interested party may seek to shut out evidence or may press for the principles of a criminal trial where there comes a stage when the case for the prosecution is definitely closed. While all coroners will wish to observe the rules of fair play on which British criminal procedure is based, it is certainly impossible to coördinate inquest procedure with that of assize courts where a specific person is accused of a specific offence. So long as the coroner's court continues, he must have a discretion to conduct the proceedings in his own way.

PARIS

(FROM OUR OWN CORRESPONDENT)

FRENCH DENATALITY

THE decline of the birth-rate has for many years been a popular theme for French Jeremiahs, the latest of whom is Dr. L. Devraigne who, in a communication to the Academy of Medicine on Christmas Eve, entertained his audience with certain lugubrious statistics. In 1868 there were 1,034,000 births, whereas in 1934 there were only 667,000, of which 50,000 were in the families of foreigners. Between 1868 and 1934 the population of France has risen only from 38 to 41 millions. Even in the brief interval between 1932 and 1934 there has been a decline of 45,000 in the birth-rate, whereas in Germany in the first quarter of 1935 there were 47,000 more births than in the corresponding quarter in 1934. In the four years 1930–34 the number of marriages was reduced by 44,000 to 298,000, a decline so prodigious that Dr. Devraigne is surely justified in commenting on it with an exclamation mark. It is true that infant welfare work is much more effective now than it was forty years ago, when 150,000–180,000 infants died every year, and in 1934 there were only 47,000 deaths during the first year of life. But even if, as Dr. Devraigne believes, this figure can be further reduced, the denatality of France will not have been successfully combated. If the country is not to become one vast infirmary for old folk, there must be an average of three children per family, and even this modest standard can only be attained, he thinks, by generously subsidising large families from public funds.

THE FAMILY DOCTOR OF THE FUTURE

A correspondent of *Concours Médical*, who signs himself Briau, draws a modest but quite attractive picture of the family doctor of the future. The family doctor of to-day has died a more or less natural death, the cause of which is specialisation. Perhaps this is just as well for, according to Briau, he had fallen from that high estate enjoyed by the contemporaries of Balzac. In those days the practice of medicine was an art: now it is supposed to be a science. The transition from one to the other has left the family doctor in the lurch; losing the art of his predecessors, he has not compensated for this loss by acquiring the science of his contemporaries, the specialists. Having recorded his death with the causes thereof, Briau proceeds to model from the corpse a new family doctor, less resplendent but more useful. He must not expect great emoluments or great honours, but the modesty of his income and station in life is to be compensated for by the feeling that he fits into the picture. His education is to be general and thorough, essentially practical and

unembarrassed by post-graduate courses in special subjects which divert his attention from his primary function. Like a station-master, he is to control and supervise rather than to lay his own hands on any task requiring great technical skill. He is to be responsible for prenatal and postnatal infant welfare, but the confinement itself is to be in the hands of the specialist that he has advised the family to summon. As the child grows older and the parents are tempted to offer themselves the luxury of an imperious (sic) English nurse, he must not let himself be ousted, and he must remember that what may be good for little Anglo-Saxon children born in the fog of their cold and wet country is not necessarily just what Latin or Celtic babies need. He will prevent scolioses, dystrophies, and the rest by shunting the incipient patient off to an appropriate specialist. Though he must not specialise, the future family doctor must read medical periodicals and attend medical meetings in order to keep abreast of the times and to distinguish between the specialists to avoid and those to consult.

PANEL AND CONTRACT PRACTICE

Temporary Residents

THE London local medical and panel committee recently suggested to the insurance committee that the distribution scheme should be amended so as to provide that in respect of temporary residents in convalescent homes or similar institutions credits shall be given only in those cases in which a continuation card is submitted containing evidence that medical treatment (which should not include an examination for the purposes of the home) has been given. The subcommittee of the insurance committee expressed the opinion that the proposal was worthy of adoption if made applicable to all temporary residents and the panel committee has now decided to vary its proposal accordingly.

Another Case for Clause 7 (2)

Two insurance doctors have just had to appear before the London medical service subcommittee simply because, according to the facts found by the subcommittee, they had handled a case in their own way instead of acting in accordance with the terms of service. A girl, aged 16½ years, became ill and went with her mother to the surgery of the senior partner, receiving treatment for which a fee was demanded. According to her statement to the subcommittee, the mother demurred, pointing out that, although her daughter had not received a medical card, she was in fact insured. The doctor said she should pay and then apply to the committee for a refund, but no fee was actually paid as the doctor had not the necessary change. Next day the junior partner visited the girl at home, and a similar conversation ensued but no fee was paid on this occasion either. A third consultation took place two days later but on this occasion no reference was made to insurance. An account was rendered and was paid, the junior partner telling the mother that she should apply to the committee for reimbursement. The senior partner told the committee that he had no recollection of anything being said about the patient being insured, while the junior partner was positive that nothing was said when he saw the girl. The mother, on the other hand—she is an insured person on the list of the junior partner—was equally positive that both the doctors were made aware of the position and in fact that her application for reimbursement was made at the suggestion of the junior partner. At the conclusion of the hearing both doctors agreed that there had probably been a misunderstanding and they expressed their willingness for the case to be dealt with as though they had issued form G.P.4. The committee found that there had been a failure on the part of the junior partner to comply with the terms of service, but in view of his offer to refund the amount charged, decided to take no further action in the matter. And all this trouble might have been saved if the practitioners had followed the procedure laid down for their protection in Clause 7 (2) of their Terms of Service.

The Chemist who was Annoyed

A test prescription for Mist. gent. acid. was recently presented to a certain chemist, and in due course the medicine was analysed. The analysts stated that in addition to a trace of hydrochloric acid and possibly a small proportion of infusion of gentian (there should have been 200 and 300 minims respectively) the sample contained hydrobromic acid equivalent to 146·8 minims of acid. hydrobrom. dil., and alkaloids of nux vomica equivalent to approximately 16 minims of extr. nuc. vom. liq. or 190 minims of tinct. nuc. vom. in the 10·65 fluid ounces dispensed. The chemist was invited to explain the discrepancy, but the only remarks offered by him were that "whatever concoction the analyst has been analysing it has nothing whatever to do with the mixture that I dispensed and supplied." In further letters he attacked the staff of the insurance committee, and when writing to say that he did not propose to attend the hearing by the pharmaceutical service subcommittee, he made the somewhat naïve suggestion that it would be remarkable if he could compound Mist. gent. acid. without getting any of the ingredients into the bottle. But he did not take the precaution of having the second half of the mixture analysed by an independent analyst and has only himself to thank that the committee are asking the Minister to withhold the sum of £5 from his remuneration.

A Part-time Assistant

Three insurance doctors, each with the maximum number of insured patients, are in partnership and have recently had to refuse new acceptances in order to bring their lists within the permitted maximum. The partners realise that to refuse acceptances may adversely affect their practices, and have applied for the consent of the insurance committee to their employing an assistant, but they take the view that the extra number of insured persons likely to secure inclusion in their lists would not justify the expense of a whole-time assistant, and so they have asked to be allowed to have an assistant for two days a week until the extra number of insured persons justifies the appointment of a full-time assistant. The maximum additional number of patients who may be accepted by virtue of employing an assistant is 1500, and the committee have acceded to the doctors' request upon the condition that while the assistant is employed for not less than two days a week the additional number of insured persons accepted shall not exceed 350.

PUBLIC HEALTH

Diphtheria v. "Bacteriological Diphtheria"

PUBLIC authorities who control not only schools, day and residential, in which cases of diphtheria may occur but also infectious diseases hospitals to which they are removed are as much concerned to limit the number of cases as to economise the occupation of beds. There can be no question that the child with definite or even suggestive clinical evidence of diphtheria is properly removed to hospital for further investigation and treatment. There is equally no question that the increasing practice of indiscriminate swabbing without virulence tests and without determination of the state of immunity by Schick tests results in the unnecessary hospitalisation of numbers of children who are neither in danger themselves nor dangerous to the community from which they are removed. Entitled "Nomenclature of Diphtheritic Infections," a report just published [1] presents the conclusions of a L.C.C. departmental committee appointed by Sir Frederick Menzies. The title is an understatement of the contents of the report which covers far wider ground, since procedure is suggested for dealing with children, both immunised and non-immunised, in schools and homes of all types from whom positive swabs have been obtained but who show no clinical manifestations of diphtheria.

Diphtheritic infections include the various clinical forms of the disease, "bacteriological diphtheria"—that "tautological and meaningless" label—and carriers both convalescent and contact. Diphtheria is defined in the report as the reaction of the body to *virulent* strains of the *C. diphtheriæ*, and the keynote throughout is insistence upon virulence tests of the organism in the absence of clinical signs of the disease. Attention is drawn to the danger to others of the child suffering from anterior nasal diphtheria, in the opinion of the committee the commonest source of infection, particularly in schools and hospital wards. The condition, although intensely infective, produces as a rule nothing more than nasal discharge and debility which may be unremarked until severe types of the disease have arisen in other children as the result of contact. There can be no doubt that frank nasal diphtheria is a greater menace than the occult carrier state, since the dosage of infection transmitted is likely to be greater.

In the production of convalescent carriers there are, the report says, only two factors: a clinical attack of the disease and an unhealthy condition of the nasopharyngeal mucosa. The factors which are operative in producing "healthy" or contact carriers are the opportunity for and amount of infection and the local condition of the respiratory passages under which the bacillus may survive. What results from the contact-carrier state depends upon the state of immunity at the time of infection. Thus non-immunes may contract clinical diphtheria or, as the result of summation of subclinical doses of infection, attain "natural" immunity. Immunes may be transient contact carriers or become chronic carriers. It is emphasised that since they do not contract clinical diphtheria, the greater the number of immunes in a closed community the higher the carrier rate tends to become. In a community wholly immune, carriers are not harmful but beneficent, since the repeated infection of immunes tends to raise, or at least to maintain, the level of antitoxic immunity. The moral of this is obvious. The presence of virulent strains of the diphtheria bacillus in any considerable community of children is wellnigh inevitable. If some of these children are susceptible to the disease, outbreaks of clinical diphtheria are from time to time almost as inevitable.

Hence the report advocates the determination of the state of immunity of *all* inmates by means of the Schick test and the active immunisation of *all* positive reactors, confirmatory Schick tests being insisted upon. Half-measures are not only useless but detrimental to the progress of immunisation. It is among institutions whose inmates are only in part immune, or whose state of immunity following prophylactic injections has not been verified, that the objector (always on the lurk for mischief) finds some of his most venomous barbs. This lead from the largest public health authority in the world is to be welcomed by those who would put an end to the suffering of children from a preventable disease. The report proceeds to lay down the steps which should be taken for the disposal of cases under the various conditions of institutional practice, and concludes with an appendix in which are described the correct method of swabbing and the details which should be supplied to the bacteriologist; the inoculation of media; standard forms of report which should be used by bacteriologists; and the clinical significance of the bacteriological findings.

Practitioners who rely upon the morphological diagnosis of the diphtheria bacillus in a smear or culture may study with advantage the following scheme for the complete identification of the organism given on p. 16 of the report.

Stages in the Complete Identification of Virulent Diphtheria Bacilli and Time Occupied (in Days) from Taking the Swab

Day	Stage		
0	1st	Swab	
0	2nd	Löffler	
1	3rd	Micro. positive	Micro. negative.
1	4th	Inoculate tellurite plate	
3 (m.)	5th	Diphtheria-like colonies	Negative (diphtheroids or Hofmann only).
3 (m.)	6th	Inoculate serum agar	
3 (aft.)	7th	Inoculate fermentation tubes	
	8th	Read fermentation tests	Negative (diphtheroids or Hofmann only).
		True diphtheria bacilli	
4	9th	Virulence test	
5 or 6	10th	Result of test	Non-virulent diphtheria bacilli.
		Virulent diphtheria bacilli	

m. = morning; aft. = afternoon.

Intended primarily for the guidance of medical officers in the L.C.C. service, the report, which is a

[1] Report of Departmental Committee (A. F. Cameron, E. H. R. Harries, A. Joe, J. E. McCartney, and A. Topping). London: P. S. King and Son, Ltd. No. 3161. 3d.

reflex of modern practice in the control of diphtheria in institutions, should find a wider medical public. It contains a good deal for threepence.

Rat Plague

Early in December last a dead rat found in a grain warehouse at the docks at Liverpool was submitted to the bacteriologist for examination and found to be infected with plague. An intensive search and rat destruction campaign was immediately carried out in the vicinity, with the result that a few days later one of many trapped rats was also found to be infected. Although vigorous action has continued to be taken it would appear that no other plague-infected rats have been found, and there have been no human cases. The docks of Liverpool have an extensive trade with South America and the East, from both of which parts of the world plague-infected rats may gain access to this country, especially from grain-bearing ships.

It would probably be true to say that the destruction of rats on ships and on docks, and the search for plague-infected rats, has come to be the major activity of port sanitary authorities. During the year 1934, 2739 rats were caught in ships at the port of Liverpool, of which all but 2 were of the black variety, and in addition 2121 rats were caught on the quays, of which all but 156 were black. It is, of course, the black variety of rat which is most likely to be infected with plague. The examination of rats for evidence of plague infection is carried out extensively; the number of rats examined at Liverpool in 1934 was 3486, of which all but 227 were black. Although the most careful precautions are taken (by exercising the powers and duties prescribed by the Port Sanitary Regulations, 1933) to keep down the rat population on ships, and to prevent the access of rats from ships to the shore, the danger of the introduction of plague is a cause of constant concern to port medical officers of health, and the prompt detection of the presence of plague-infected rats at Liverpool is evidence of the attention given to the subject. The more intensive activities which have followed the discovery seem to give assurance that no enzoötic will occur in the area. Under present-day powers and administration a recurrence of the widespread rat infection which took place in East Anglia early in the century is highly improbable.

It is only occasionally that the importance of the large-scale routine work of the port sanitary authorities is prominently brought before the public, but port medical officers are well aware that if the work of their staffs was not carried out with assiduity and inteliigence occurrences of this kind would not only be more frequent, but also much more serious.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

The death of H.M. King George V.—The *London Gazette* of Jan. 24th publishes Orders in detail for the mourning to be worn by Officers of the Royal Navy and Royal Marines, Officers of the Army, and Officers and Warrant Officers of the Royal Air Force for six months from Jan. 21st, ending July 20th, 1936.

Surg. Comdrs. G. W. Woodhouse to R.N. Hospital, Portland; R. W. Higgins to *President* for course; and W. G. C. Fitzpatrick to *Victory* for R.N.B., and to *Vernon*.

Surg. Lt.-Comdr. T. F. Crean to *Pembroke* for R.N.B., Chatham.

Surg. Lt. (D.) R. W. Stevens promoted to rank of Surg. Lt.-Comdr. (D.).

Surg. Lts. D. W. Walker to *Pembroke* for R. M. Infirmary, Deal; and T. McCarthy to *Furious*.

VACANCIES FOR MEDICAL OFFICERS AND SURGEON LIEUTENANTS (D.)

Applications are invited for eight vacancies in April for Medical Officers in the Royal Navy. Copies of the regulations for entry, conditions of service, &c., may be obtained from the Medical Director-General of the Navy, Admiralty, S.W.1, and from the Deans of all Medical Schools. Applications for entry must be received not later than Feb. 22nd.

The establishment of Dental Officers in the Royal Navy has been increased and applications are invited for appointment to commission as Surgeon Lieutenants (D.). Application forms and a pamphlet may be obtained from the Medical Director-General of the Navy, Admiralty, S.W.1. Applications for entry in March must reach the Medical Director-General not later than Feb. 6th.

ROYAL NAVAL VOLUNTEER RESERVE

H. B. Howell entered as Proby. Surg. Lt.

Proby. Surg. Lt. H. J. Wade to *Excellent*.

Proby. Surg. Sub-Lts. D. S. Macphail and J. A. Shepherd to be Surg. Sub-Lts.

ROYAL ARMY MEDICAL CORPS

Maj. T. C. Bowie retires on ret. pay.

Capts. T. W. Davidson and C. R. Christian to be Majs. (Substituted for notification in the *Gazette* of May 8th, 1934.) (*Vide* THE LANCET, May 19th, 1934, p. 1080.)

Capt. J. G. E. Vachell to be Maj. (Substituted fo notification in the *Gazette* of Feb. 15th, 1935.) (*Vide* THE LANCET, Feb. 23rd, 1935, p. 450.)

TERRITORIAL ARMY

Capt. G. W. Wright, M.M., T.D., to be Maj.

Lt. R. Rutherford to be Capt.

Hugh Weir (late Cadet Serjt., Glasgow Univ. Contgt., Sen. Div., O.T.C.), to be Lt.

James Lockhart Gowan (late Cadet, George Watson's Coll. Contgt., Jun. Div., O.T.C.), to be Lt.

ROYAL AIR FORCE

The undermentioned Flying Offrs. are promoted to the rank of Flight Lt.:—

A. W. Smith, J. W. Patrick, J. S. Wilson, C. A. Lewis, R. G. James, and G. H. Stuart.

Flying Offrs. C. M. Carlyle-Gall to R.A.F. Station Aldergrove; E. B. Harvey and D. S. MacL. MacArthur to Medical Training Depôt, Halton, on appointment to short service commissions.

Flying Offr. R. S. Peill to R.A.F. Station, North Coates Fitties.

Dental Branch.—Flight Lt. J. G. Stewart is transferred to the Reserve, Class D.

Flying Offrs. D. P. Boyle to No. 5 Flying Training School, Sealand; K. G. Swiss to No. 3 Flying Training School, Grantham; and H. M. G. Williams to Headquarters, Coastal Area, Lee-on-the-Solent.

VACANCIES FOR COMMISSIONS IN THE MEDICAL BRANCH

Applications are invited from Medical Men for appointment to Commissions in the Medical Branch of the Royal Air Force, for entry in May, 1936. Copies of the regulations and form of application may be obtained on application from: The Secretary, Air Ministry (D.M.S.), Adastral House, Kingsway, W.C.2. Completed applications from intending candidates for the vacancies in May, 1936, must be received in the Air Ministry not later than March 17th, 1936.

INDIAN MEDICAL SERVICE

Col. W. H. Hamilton, C.I.E., C.B.E., D.S.O., F.R.C.S., I.M.S., is apptd. Hon. Physician to the King, Oct. 22nd, 1935, vice Col. E. C. Hodgson, D.S.O., I.M.S., retd.

Indian Medical Department.—Maj. (Sen. Asst. Surg.) L. P. Gernon retires.

USE OF ANALGESICS BY MIDWIVES

REPORT OF AN INVESTIGATION BY THE BRITISH COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS[1]

AT the request of the National Birthday Trust Fund the British College of Obstetricians and Gynæcologists has carried out an investigation to ascertain if there is any form of analgesia (relief from pain) which can be used with safety and success by a midwife in the absence of a medical practitioner. The trial has been made in institutions, as adequate medical supervision and facilities for the necessary observation and accurate recording of results are more readily available in such places. Thirty-six hospitals, for the most part maternity hospitals or departments attached to medical schools, accepted the invitation to take part in the investigation.

Five methods were adopted for investigation: (1) chloroform capsules, (2) the Christie Brown chloroform inhaler, (3) the Mennell chloroform inhaler, (4) the Minnitt gas-and-air apparatus, (5) the administration of paraldehyde per rectum. The records of nearly 10,000 cases have been studied and classified into three main groups: (1) nitrous oxide and air, (2) chloroform, (3) paraldehyde.

Nitrous Oxide and Air

Nitrous oxide and air was administered with the Minnitt apparatus to 3865 cases, and in 627 of them an additional anæsthetic was administered, mainly on account of some obstetric difficulty. Nitrous oxide and air was thus administered to 3238 cases without any supplementary anæsthetic or analgesic. In this series there were three maternal deaths which were in no way due to the analgesia. Among the 627 cases in which an additional anæsthetic was administered there were six maternal deaths; in every case the death was the result of serious obstetric difficulty and in no case was it attributable to the administration of the gas and air.

The stillbirth-rate when the Minnitt apparatus alone was used was 2·0 per cent. When administered by a sister, staff-nurse, or pupil-midwife it was 1·2 per cent. The higher stillbirth-rate in cases undertaken by a medical practitioner is accounted for by the fact that he would be more likely to be called upon in difficult cases in which a relatively high stillbirth-rate is to be expected. When a full anæsthetic was given (frequently on account of some obstetric abnormality) the stillbirth-rate was 4·3 per cent. The stillbirth-rate for the whole series, however, shows that the method does not involve any added risk to the fœtus, and the low stillbirth-rate when the analgesic was self-administered (or administered by a pupil-midwife) indicates that the actual administration does not call for more special skill than that which may be acquired by a midwife during her period of training.

The number of cases in which obstetric interference was necessary is an indication of the degree to which the normal forces of labour were interfered with. In the series of 3865 it was 8·4 per cent. (forceps delivery alone 6·6 per cent.), and as these figures compare favourably with the interference-rate in ordinary practice, the conclusion is justified that this method has no deterrent influence on the natural course of labour.

[1] The report, of which this is a summary, was passed by the College at its meeting on Jan. 25th, 1936, and is signed by the president, Sir Ewen Maclean. Copies may be had, price 1s., from the hon. secretary of the College, 58, Queen Anne-street, London, W. 1.

The records of the patients who received analgesia from the Minnitt apparatus have been analysed (Table I.) as regards the efficacy of the method.

TABLE I

Efficacy of Gas-and-Air Analgesia

	Per cent.
Satisfactory	77·0
Doubtful	5·3
Unsatisfactory	17·7

Investigation was further made into the relative effectiveness of this form of analgesia when self-administered or when administered by persons of varying degrees of experience. The proportion of cases in which satisfactory analgesia was obtained with various classes of administrators is set out in the table below. Table II. is an analysis of 3238 cases in which the Minnitt gas-and-air apparatus was used without any additional anæsthetic or analgesic.

TABLE II

Efficacy of Gas-and-Air Analgesia in the Hands of Various Administrators

Administered by—	Total cases.	Percentage of satisfactory cases.
Patient herself	1086	.... 88·0
Pupil midwife or Medical student ..	553	.... 81·4
Midwife	797	.... 82·1
Medical practitioner ..	802	.... 82·8

CONCLUSIONS

(1) The investigation has proved that the administration of gas and air by the Minnitt apparatus is safe for use by midwives in hospital, provided that a recent examination by a medical practitioner has revealed no contra-indication thereto.

(2) The use of that apparatus should be restricted to those midwives who have had a special training in its use, and who have shown themselves capable of managing it. Such training could be carried out concurrently with that for the certificate of the Central Midwives Board when the proposed longer period of training is adopted. For those already holding the C.M.B. certificate a special course would be required. The reasons for stressing the importance of a long training are that it requires considerable experience to learn the essentials of obstetric analgesia. Furthermore, experience in mechanical adjustments and in the changing of gas cylinders is essential if the machine is to work efficiently.

(3) Gas and air administered by the Minnitt apparatus produces satisfactory analgesia in a high proportion of cases. Sometimes, however, there is a restlessness and difficulty in controlling the patient; it is essential, therefore, that one other responsible person should be present in addition to the midwife in charge of the case.

(4) Further experience is necessary before the suitability of the Minnitt apparatus for domiciliary practice is proved, as this investigation has only been carried out in hospitals where additional help was always readily obtainable.

(5) Owing to the weight and bulk of the apparatus, transport would present serious difficulties if used in domiciliary practice, but it is possible that the wider use of "light" cylinders and further simplifications of the apparatus may go far to solve this problem.

(6) The apparatus presents certain mechanical difficulties which have necessitated return to the makers. Whilst due regard must be given to those difficulties, it may be possible to overcome them, once there is a sufficient demand to stimulate mecha-

nical improvements. It must be borne in mind, however, that a certain amount of mechanical aptitude would be still required to change cylinders of gas and to make minor adjustments. Such adjustments involve the use of a spanner and the frequent inspection of washers and joints.

(7) The cost of the apparatus is a handicap to general use. Apart from the initial expense, the cost of the nitrous oxide is high. Moreover, there is a serious risk of wastage owing to the fact that, as the apparatus is now constructed, leakage may occur at many places unless constant attention is given to minor adjustments.

Chloroform

In the majority of patients chloroform analgesia was used alone, but in some it was necessary (frequently on account of some obstetric abnormality) to supplement the analgesia with general anæsthesia. Thus, for each method the patients have been divided into two groups (Table III.), and the maternal deaths in each group have been recorded.

TABLE III

Maternal Deaths with Different Methods of Chloroform Analgesia

Method.	Analgesia alone.		Analgesia plus general anæsthesia.	
	Total cases.	Deaths.	Total cases.	Deaths.
Chloroform capsules ..	2338	1	194	0
Mennell inhaler ..	1430	1	141	2
Christie Brown inhaler..	809	0	63	2
Total	4577	2	398	4

Thus the maternal mortality-rate in this group of 4975 patients was 1·2 per thousand. From a study of the details of these six deaths, the conclusion reached is that chloroform was directly responsible for death in one case, that it was probably an important factor in the fatal issue in two cases, and that it was in no way responsible for death in three cases.

The total stillbirth-rate for all cases in which the analgesia was obtained (Table IV.) by the use of

TABLE IV

Stillbirth-rate with Different Methods of Chloroform Analgesia.

Method.	Analgesia alone.		Analgesia plus general anæsthesia.	
	Total cases.	Stillbirth rate per cent.	Total cases.	Stillbirth rate per cent.
Chloroform capsules ..	2338	2·4	194	17·5
Mennell inhaler ..	1430	1·3	141	4·3
Christie Brown inhaler..	809	1·9	63	3·2

chloroform was 2·6 per cent. It includes all cases in which obstetric interference became necessary after the analgesia had been started, so that it may be said that there is no evidence that the chloroform analgesia is attended by increased risk to the fœtus.

The interference-rate for all cases receiving chloroform capsules was 5·3 per cent. (forceps delivery 3·7 per cent.). Thus there is no evidence that the use of chloroform as an analgesic in these cases caused any material interference with the normal forces of labour. Table V. shows the efficacy of the analgesia produced by the three methods investigated.

TABLE V

Efficacy of Analgesia with the Three Methods of Chloroform Analgesia

	Chloroform capsules, per cent.	Mennell inhaler, per cent.	Christie Brown inhaler, per cent.
Satisfactory ..	81·8 ..	84·9 ..	78·8
Doubtful	3·7 ..	2·7 ..	6·3
Unsatisfactory ..	14·5 ..	12·4 ..	14·9

Investigation has been made into the proportion of the patients in whom satisfactory analgesia was obtained when the analgesic was administered by persons of varying degrees of experience. Table VI. is an analysis of the cases in which no additional anæsthetic was given.

TABLE VI

Efficacy of Chloroform Analgesia in the Hands of Various Administrators (percentage of patients who obtained satisfactory analgesia)

Administered by—	Chloroform capsules.		Mennell inhaler.		Christie Brown inhaler.	
	Per cent.	Cases.	Per cent.	Cases.	Per cent.	Cases.
Patient herself ..	87·7	(277)	83·4	(477)	82·1	(252)
Pupil midwife or medical student	81·8	(1239)	81·5	(92)	82·2	(157)
Certified midwife	83·9	(695)	92·1	(559)	81·3	(347)
Medical practitioner	86·6	(127)	93·7	(302)	88·8	(53)

Note.—The figures in parentheses represent the total numbers of cases in the several groups.

CONCLUSION

Chloroform by any method should not be used by midwives acting alone. This conclusion has been reached with regret, but both the immediate and delayed dangers which are well recognised occurred in this investigation, and it is not possible fully to guard against such occurrences if the administration of chloroform is in inexperienced hands. This finding should not be taken to prejudice the administration of chloroform in midwifery by registered medical practitioners who, aware of the dangers, can take precautions to lessen the risks.

Paraldehyde

While there can be no doubt that in some selected cases the use of paraldehyde, given in oil per rectum during the first stage of labour, may be a valuable means of relieving pain, the general opinion of those who have used it as a routine method in this investigation is that it is unsuitable for general use by midwives. In arriving at this conclusion they have had in mind the technical difficulties in administering the drug, the need for careful selection of suitable patients, the choice of time for giving the injection, its variable action even when patients are carefully selected, and the inadequate analgesia at the time of the actual birth of the child. This last is probably the most important objection to its widespread use by midwives, since, even if effective in the early stages of labour, some additional method of analgesia must be provided if the pain associated with the moment of birth is to be relieved.

CORRESPONDENCE

BACTERIOLOGICAL TESTING OF MILK

To the Editor of THE LANCET

SIR,—Your issue of Jan. 11th comments on an extract from my annual report for 1934, dealing with the bacteriological examination of samples of graded milk, which appeared in the *Medical Officer* of Dec. 28th, 1935. "Dr. Howell," it is remarked, "is hardly being fair when he assumes that variations in count are due to the failure of bacteriologists to 'faithfully and carefully carry out the suggested procedure.'" Other factors are suggested as the likely cause of the widely different results given by different laboratories of the examination of samples of the same milk. "The factor which probably has most effect on the bacterial content of milk is the state of the weather, which is altogether outside the bacteriologist's control." Unless samples are transported to the laboratory on ice "there may be big variations in bacterial growth within a short period of transit."

This fact is of course well known by everyone with an elementary knowledge of milk bacteriology, but cannot be advanced as an explanation of the wide divergence of the figures in the reports I have quoted. One bottle of milk was taken and after thorough shaking was divided into six parts. The milk, before division, and the bottles into which it was placed were of an even temperature. The bottles were immediately packed into an efficient ice-box and conveyed to the laboratories. The difference in time taken for delivery of the parts which were reported to have the lowest (9270) and the highest (3,400,000) total counts was about 20 minutes. The temperature of the milk upon arrival was stated by the laboratories to be 13° C. in the first case and 11° C. in the second case. It will be seen that the part for which the lower temperature was given was stated to have a bacterial count 360 times greater than that of the part for which the higher temperature was given. As a further proof that the temperature of the milk had nothing to do with the difference in the figures I have quoted, I would point out that each laboratory gave the same temperature for the two parts which they each examined, yet each laboratory gave different figures for the two parts, in one case the results varied from 147,000 to 3,400,000.

I fully appreciate the difficulties of trying to standardise a test of this sort and I have pointed out that particular attention must be paid to every detail. Your article states, "There are mechanical faults such as errors in the graduation of pipettes to be controlled"—but surely this is a difficulty quite easy to overcome. Every properly equipped laboratory should have standardised equipment.

The Milk and Dairies (Amendment) Act gives power to a local authority to withdraw a licence to sell graded milk, if reports on a dairyman's milk show that samples do not comply with the standards laid down. It would be most unfair if such action was taken on reports which gave incorrect figures due to the use of improperly graduated pipettes in the laboratory. I agree that the human element plays an important part in the bacteriological examination of milk. I still consider, however, that the tests are worthless unless they give more comparable results. I hold no brief for the dairyman who does not take every precaution to safeguard his milk but, at the same time, I sympathise with the man who may be called upon to answer charges on unreliable data. Dairymen have been and are being prosecuted for selling graded milks not in conformity with the standards. In view of my experience it may well be that some at least are innocent of the charges made against them.—I am, Sir, yours faithfully,

J. B. HOWELL,
Jan. 24th. Medical Officer of Health, Hammersmith.

MEDICAL EDUCATION AND BLOOD EXAMINATION

To the Editor of THE LANCET

SIR,—I should like to endorse all that Dr. Herbert Brown says in his letter in your issue of Jan. 11th. The medical journals have unfortunately given little encouragement to the routine examination of the blood in diagnosis and prognosis in their editorials on the subject, and I was told by the head of a preparatory school that he wished me to discontinue "blood examinations" as "the boys didn't like it and other doctors were able to do their job without it."

The discovery of early leucocytosis in a lobar pneumonia saves much exhausting examination of the chest. The search for the return of the eosinophils justifies a daily differential count, the "drift from the left" being also noted, and are signs of improvement so much more certain than any symptom. There is just one additional point to stress—one should have a record of the patient's blood picture in normal health. To quote Dr. Brown, "the process is interesting, even fascinating" and extremely valuable. He has, I think, mentioned the one drawback—it takes an hour in each case.

I am, Sir, yours faithfully,

Battle, Sussex, Jan. 22nd. H. ANGELL LANE.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 18TH, 1936

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2554; diphtheria, 1283; enteric fever, 13; acute pneumonia (primary or influenzal), 1219; puerperal fever, 46; puerperal pyrexia, 105; cerebro-spinal fever, 22; acute poliomyelitis, 3; acute polio-encephalitis, 2; encephalitis lethargica, 5; dysentery, 23; ophthalmia neonatorum, 87. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 24th was 3964, which included: Scarlet fever, 1120; diphtheria, 1129; measles, 475; whooping-cough, 610; puerperal fever, 19 mothers (plus 13 babies); encephalitis lethargica, 283; poliomyelitis, 5. At St. Margaret's Hospital there were 20 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 3 (3) from enteric fever, 58 (7) from measles, 6 (1) from scarlet fever, 27 (11) from whooping-cough, 42 (3) from diphtheria, 37 (11) from diarrhœa and enteritis under two years, and 89 (18) from influenza. The figures in parentheses are those for London itself.

The mortality from influenza is falling, the total deaths for the last seven weeks (working backwards) being 89, 110, 110, 80, 67, 62, 45. The deaths this week are scattered over 52 great towns, Leeds reporting 7, Birmingham 6, Newcastle-on-Tyne 3, no other great town more than 2. Liverpool had to report 19 deaths from measles, Manchester 9, Croydon and Salford each 3. Liverpool also had 4 deaths from whooping-cough, Manchester 2. Deaths from diphtheria were reported from 28 great towns, Hull, Manchester, Oldham and Sunderland each reporting 3; Leeds, Liverpool, Birmingham, and Swindon each 2.

The number of stillbirths notified during the week was 259 (corresponding to a rate of 42 per 1000 total births), including 43 in London.

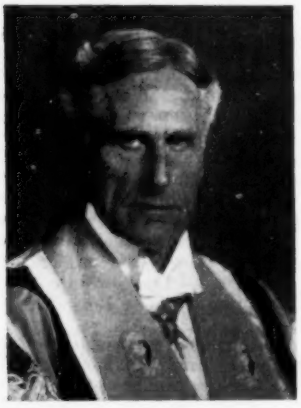
OBITUARY

WILLIAM BLAIR-BELL, M.D. Lond., F.R.C.S. Eng.

LATE PRESIDENT, BRITISH COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS

THE news of the sudden death of Prof. Blair-Bell, which occurred on Saturday last, Jan. 25th, has been received with deep regret by the medical world and a large circle of public and private friends. He enjoyed a great and even international reputation as gynæcological and obstetrical surgeon with a large scientific outlook.

William Blair-Bell was born at Wallasey in 1871, the son of the late Dr. William Bell, J.P., and Helen, daughter of the late General Butcher. He received his general education at Rossall and went for his medical training to King's College, London, where he was a successful student, Warneford and Junior medical scholar, prizeman in physiology and obstetric medicine, and Tanner prizeman in gynæcology. He took the double English diploma in 1896 and graduated as M.B. London in the following year, when he was elected an Associate of King's College. He was prosector at the Royal College of Surgeons of England, and demonstrator of anatomy and physiology in King's College, and early showed his mark as clinician and observer by papers in the King's College Hospital Reports, the *Edinburgh Medical Journal*, and *The Lancet*. He proceeded to the M.D. Lond. in 1902 and took the B.S. Lond. in 1904.



PROF. BLAIR-BELL

Photograph by Elliott & Fry

He now returned to Liverpool, with which city he was for the next 30 years and more so importantly connected. He was appointed in 1905 gynæcological surgeon in charge of out-patients at the Royal Infirmary, Liverpool, and held appointments also at the Wallasey Cottage Hospital and the Wallasey Dispensary. His work immediately attracted wide attention. He communicated regularly to the *Proceedings* of the North of England Gynæcological Society, and his coöperation became sought by the editors of systematic treatises. He wrote the articles on malformation of the uterus, injuries to the uterus, fistulæ of the uterus, and subinvolution of the uterus, in Latham and English's system of treatment; he wrote the section on obstetric operations and on sexual functions in women in the "Practitioners' Encyclopædia," and the chapter on operations on the Fallopian tubes in Burghard's "System of Operative Surgery." His papers in *The Lancet*, *British Medical Journal*, *Practitioner*, and the *Proceedings* of the Royal Society of Medicine, sometimes alone and sometimes in collaboration, all showed him to be a resourceful surgeon with an unusual knowledge of physiology—papers published in the *British Medical Journal* on the physiology of the female genital organs (in collaboration with Pantland Hick) and a communication to the Royal Society of Medicine on the relations of calcium metabolism to menstruation may be instanced.

In 1910 Blair-Bell gained the John Hunter medal of the Royal College of Surgeons of England and the triennial prize for an essay on the anatomy and physiology of the pituitary body and the relationship with disease of its abnormal and morbid conditions. Two years later he delivered the Arris and Gale lectures before the College, taking as his subject the genital functions of the ductless glands in the female. The lectures which were printed in THE LANCET with full illustrations showed not only the advanced nature of Blair-Bell's physiological studies and his acquaintance with detailed laboratory work in biochemistry, but also his wide reading and philosophical outlook. In 1913 he became full gynæcologist and surgeon at the Royal Infirmary, and in 1921 he was appointed professor of these subjects in the university. He held the chair in the university for ten years and was emeritus professor at the time of his death. As a teacher he was thoroughly in his element; it is not too much to say that under him there flourished the best teaching department in gynæcology of any British school.

Blair-Bell, who had now been president of the North of England Gynæcological Society and vice-president of the section of obstetrics and gynæcology at the Royal Society of Medicine, made in 1925 his first long and formal statement of views upon cancer, which afterwards became the subject of much discussion. He delivered on Nov. 10th of that year, before the Academy of Medicine in Toronto, an address on the specific character of malignant neoplasia with special reference to the control of cancer from this standpoint, and in the course of the address revealed the intensive study of the subject on which he had been engaged in coöperation with a group of Liverpool workers.

HIS WORK ON CANCER

Prof. Walter J. Dilling, director of the department of pharmacology of Liverpool University, sends the following account of this work:—

"It is a sorrowful privilege for one who has been closely associated with Blair-Bell's investigation into the nature and control of malignant disease to write a historical eulogy upon his brilliant and indefatigable endeavours to elucidate this problem. He was urged to research upon cancer by a yearning for knowledge with which he might alleviate human suffering and prolong life, and, in 1909, he formulated his "working hypothesis"—namely, that the chorionic epithelium, particularly the syncytium, was a normally malignant tissue and that a means, which could check its development, would be useful in arresting the progress of malignant growths.

"At first he explored the idea that the invasive properties of chorionic epithelium might be arrested by embryonic or placental extracts, but, when these failed, he concentrated his attention on the fact that lead salts caused abortion and were particularly deleterious to young life, surmising, as a corollary, that they might restrain the growth of neoplasms. The discovery that lead destroyed spermatozoa in the testes and induced coagulation necrosis in the ectodermal tubules of the chorion, encouraged him to treat, on Nov. 9th, 1920, an inoperable spheroidal-celled medullary carcinoma of the breast by intravenous injections of a partly colloidal lead iodide—

within a month the growth had practically disappeared, the enlarged glands subsided, and this patient is still alive. Other hopeful improvements were achieved in a variety of cases and, at a meeting on Jan. 30th, 1923, the late vice-chancellor of Liverpool University, Dr. J. G. Adami, inspired the formation of a Cancer Research Committee, which consisted originally of Sir Robert Jones, Messrs. J. A. Smith and Rex Cohen, with the present registrar of the university, Mr. Edward Carey, as acting secretary, in order to subsidise and facilitate researches upon Blair-Bell's theories and remarkable clinical results.

"Blair-Bell's knowledge of the modern advances in the medical sciences was admirably and amazingly comprehensive, but he recognised that satisfactory and rapid progress towards his objective could be achieved only by employing the 'Aggregate Mind' of his scientific colleagues. His preliminary results and his aspirations were communicated to Prof. W. C. M. Lewis (physical chemistry), the late Prof. E. E. Glynn (pathologist), and the writer (pharmacologist), who agreed to assist in the investigation. Funds, provided at first through the generosity of the Cancer Research Committee—notably by Mr. Rex Cohen—defrayed the cost of early researches and provided free treatment for poor patients in nursing homes; but, later, when the Liverpool Medical Research Organisation was incorporated for charitable purposes, financial support for the work was derived partly from voluntary subscriptions and partly from the fees of patients. Cordial coöperation was maintained between the scientific and clinical workers at the frequent meetings with Blair-Bell, when results were criticised and the scientific staff informed of the clinical effects or defects of new preparations of lead. At these discussions Blair-Bell's intellect was dominant, and displayed an alert elasticity with quickness of perception which justified his position as director and organiser of researches covering extensive fields of modern science.

"Publications by Blair-Bell and members of the scientific and clinical staff appeared from 1922 onwards, and by 1930 some 64 papers had recorded the results of intensive investigations on many aspects of the cancer problem and of the influence of lead on normal and malignant tissues. These researches were subsequently collected and co-related by Blair-Bell in 'Some Aspects of the Cancer Problem,' and a consideration of the evidence contained therein will vindicate Blair-Bell's reputation from the suggestion that he maintained undue reticence about his methods or results, will substantiate the reasons for his caution in endeavouring to restrict the general therapeutical use of lead compounds in malignant disease until their specific value was more definitely determined and their toxicity more easily controlled, and will also justify his belief that lead salts exert an inhibitory influence on some forms of neoplasms. Interest in the work was excited in many parts of the world, and supporting evidence accumulated from many sources, amongst others from Carter Wood in America. As the investigation proceeded, changes and—latterly from lack of funds—restrictions in the fields of the research became necessary. Prof. I. M. Heilbron's collaboration—and recently that of Prof. A. Robertson—achieved the synthesis of many less toxic compounds of lead and the beneficial effects of these in selected cases continued to maintain the hope that the pursuit of this line of inquiry would ultimately yield a compound of lead which possessed greater and more reliable inhibitory effects on tumours both in animals and in man.

"Although he retired from his chair and active practice in 1931, Blair-Bell still maintained an intimate relationship with this research work which, under the direction of Dr. Morris Datnow, continues, so far as restricted funds permit, to be prosecuted actively in Liverpool, both in its scientific and clinical aspects and with results which continue to support the view that intravenous injections of suitable lead compounds do cause in a percentage of cases a retardation or even retrogression of some malignant growths. The work of the Liverpool Medical Research Organisation as a scientific body is a memorial, if still imperfect and incomplete, to the untiring zeal and devotion of Blair-Bell to the advancement of medical science, an objective for which he was always prepared to make personal sacrifices."

Blair-Bell, while frequent in his contributions to contemporary literature, had a useful treatise to his credit dating from an early period in his career. In 1911 appeared his large treatise, the Principles of Gynæcology, in which he endeavoured to present a complete and modern survey on which gynæcology should be established. The work was concise and readable, drawn up on a simple and logical arrangement, and admirably produced. While following academic lines in general he challenged attention by the stress which he laid on the importance of the calcium content of the blood and on the large part played by the secretions of the ductless glands in the causation of certain gynæcological conditions. In many directions the lapse of time would seem to have confirmed observations which were not all at the time generally accepted. This was his only textbook.

FOUNDATION OF THE COLLEGE

Blair-Bell erected a permanent memorial to his energies and his high conception of his branch of medical and surgical work when he became the prime advocate of the foundation of the British College of Obstetricians and Gynæcologists. He put forward vigorous arguments for the institution of such a college; he replied trenchantly to those who held the opposite view, and when in 1929 the college came into being it was recognised as absolutely fitting that he should be elected the first president. At the last dinner of the college Lord Dawson spoke of him as "the restless, lovable torch-bearer who never forgot—or allowed anybody else to forget—that he was bearing a torch," and his branch of the profession will never forget their debt to him.

Dr. J. S. Fairbairn, Blair-Bell's immediate successor in the presidency, writes:

"Blair-Bell's was a striking and forceful personality. Gaunt with ascetic features that did not belie the earnestness and grim determination that lay beneath them, he pursued whatever he took up with almost fanatic zeal. Gifted with a fine intellect, the power of dramatic expression, and of wide interests, he was a delightful host and companion. No one of his day and generation exercised a greater influence on British gynæcology than Blair-Bell, an outstanding instance of which was his prominent part in the foundation of the British College of Obstetricians and Gynæcologists. In spite of indifferent health, he threw himself, body and soul, into the work of drawing up its constitution and seeing through its incorporation, and, after his election as its first president, of establishing it in the position he had determined it should occupy. He had ambitions regarding the high place the new college should take and was inclined to be impatient with those, both within and without the

college, who were unable to accept his own estimate. There can be little doubt that this impatience arose in great measure from the knowledge that his life hung by a thread and might end as it did. He was certainly lavish in the expenditure of his strength and energy, for no details escaped him or were too small for his undivided attention. Nowhere will the passing of William Blair-Bell be more deeply mourned than in the college that meant so much to him and owes so much to him."

The following is a brief enumeration of the appointments that Blair-Bell held at the time of his death. He was consulting gynæcological and obstetrical surgeon to the Royal Infirmary and the Maternity Hospital, Liverpool, and emeritus professor at the university of those subjects. He was the consulting director of the Liverpool Medical (Cancer) Research Organisation, president of the Royal Infirmary, Liverpool, and honorary fellow of many obstetrical societies, British and foreign. He was elected fellow of King's College, London, in 1928, and F.R.C.S. Eng. in 1929. He was an honorary fellow of the American College of Surgeons, the universities of Liverpool and Glasgow gave him the LL.D. degree, and he was a Commander of the Royal Order of the Star of Roumania.

Prof. Blair-Bell married his cousin, Florence, daughter of Mr James Bell, who predeceased him. They had no children. Those who enjoyed his friendship or acquaintance cannot fail to remember his personality, and to recognise the aptness of Dr. Fairbairn's words. Blair-Bell was of the stuff from which great men are made, and he was a great man both in example and accomplishment.

CHARLES ANDERSON FERGUS, L.R.C.P. Edin.

THE death is announced in his eightieth year of Dr. Charles Anderson Fergus, for many years medical officer for East Kilbride parish where the whole of his medical career was spent. He practised with his father, and within the memory of many he was always entitled "the young doctor," then he became popularly known as "Dr. Charles," and lived to be affectionately spoken of as "the old doctor." He had a particularly strong hereditary claim on the regard of the neighbourhood. His grandfather was ordained minister of the Relief church 140 years ago, while his father, Dr. James Fergus, who graduated in medicine 95 years ago, founded the medical practice in Kilbride immediately after qualification. Of Dr. James Fergus's two sons, the elder, who practised in Yorkshire, is still living at the advanced age of 88 years.

MURDO TOLME MACKENZIE, M.B. Edin.

Dr. Murdo Mackenzie, who died on Jan. 11th in his seventy-eighth year, had seen 50 years' service in the Scottish islands. He was the son of the factor of the MacLeod estate and was educated at Daniel Stewart's College and the University of Edinburgh, graduating as M.B., C.M. in 1880. He was early appointed medical officer for the whole parish of North Uist, and until recently had charge singlehanded of the island and also of Grimsay, Heisker, and Berneray, but under the reorganisation of the Highlands and Islands service he became responsible only for the west side of North Uist. There he was parochial medical officer and M.O.H., surgeon to the Lockmaddy prison, and acted as sheriff substitute for Inverness-shire, of which county he was a J.P. He was also medical officer to the post office, and after the war did considerable work under the Ministry of Pensions. He endured for most of his working life the great physical hardships of practice in the island district, and became an absolute repository of the physical and family stories of his whole environment, having been either publicly, professionally, or personally in contact with practically everybody. He had a fine record of service and his reputation is safe in the recollection of the people of North Uist.

THE LATE PROF. STARR JUDD

Edward Starr Judd was born in Rochester, Minn., on July 11th, 1878, and died on Nov. 29th, 1935, when on the way to address a meeting at Philadelphia. Having graduated at Minneapolis in 1902 he became an intern at St. Mary's Hospital, Rochester, and in the following year first assistant to Dr. C. H. Mayo, the remainder of his life being spent as a member of the Mayo Clinic. In 1918 he was appointed to the graduate chair of surgery in the University of Minnesota.

Prof. Grey Turner writes: "Those who know the Mayo Clinic will be very sorry to hear of the death of Edward Starr Judd while still on the good side of 60. At the time of my first visit to Rochester thirty years ago Judd was an able second to the brothers Mayo, and in fact those three constituted the sole surgical team of that day. He was even then doing a fair share of the operative work and appeared to be thoroughly familiar with all branches of surgery. From that time to his death, save for short vacations, he operated every day of the week except Sunday, and his lists seldom ran to less than six cases, so that in the course of his career he probably did more operations than any other surgeon.

"Judd was a first-rate all-round man, and though in recent years his work was mostly confined to the abdomen, he was never a specialist in any sense of the word. He was a beautiful steady operator, always the same, never fast never slow, and above all never put out or fussy. The patient always seemed safe in his hands, and many a spectator picked him out as *the* man to operate on those near and dear. But he was not only a renowned operator but a great doctor, and the investigation and care of his patients was thorough and sympathetic. His writings were not voluminous but were always practical and sound, and like his operative work showed good judgment throughout. In the clinic Judd was obviously an influence for good, and his earnest conciliatory manner must have been an enormous asset in such an organisation. He possessed the highest of all distinctions in that he was a *maker* of surgeons, and I have heard many now well known in the surgical world who have acknowledged this indebtedness to him.

"Judd was of a quiet, restful disposition, delighting in his work, in his home, and in loyalty to his chiefs, ever on his lips as 'W. J.' and 'C. H.' His one relaxation appeared to be duck shooting, but even that fascinating sport only lured him away from work for short periods. He will be missed far beyond his immediate circle."

In 1931–32 Prof. Judd was president of the American Medical Association.

ST. BARTHOLOMEW'S HOSPITAL, LONDON. — The Smithfield Benevolent Fund committee has raised £10,000 to establish visitors' rest rooms and a canteen at this hospital.

MEDICAL NEWS

University of Oxford

Radcliffe Travelling Fellowship.—An examination for this fellowship, which is of the annual value of £300 and is tenable for two years, will be held on Feb. 18th. Candidates must have passed all the examinations for the degrees of B.M. (not more than four years previously) and B.A. Further particulars may be had from the regius professor of medicine, University Museum, Oxford, to whom all intending candidates should send their names before Feb. 13th.

George Herbert Hunt Travelling Scholarship.—Applications for this scholarship, which is awarded without examination, are invited from graduates in medicine of the university of not more than five years' standing who wish to travel abroad for at least three months for the purpose of clinical study or research in medicine. Preference will be given to those who intend to become surgeons or general practitioners, and applications should be sent to the dean of the medical school, University Museum, before Feb. 24th.

University of Cambridge

On Jan. 25th the following degrees were conferred :—

M.D.—B. C. Thompson, C. H. Wrigley, and D. N. Rocyn Jones.

M.B. & B.Chir.—S. M. Davidson and K. C. Bailey.

M.B.—Wilfrid Warren.

B.Chir.—L. J. Bacon, T. L. H. Shore, G. N. St. J. Hallett, J. R. Kerr, J. R. G. Harris, A. G. Salaman, J. R. J. Winter, C. A. Dowding, Frank Stansfield, and R. D. Ewing.

Royal College of Surgeons of England

The Begley studentship will be awarded to the candidate who this year obtains the highest marks in the anatomical part of the examination in anatomy and physiology held by the conjoint examining board in March and April. The studentship is tenable for three years, and has an annual value of £20. Further information may be had from the secretary of the college, Lincoln's Inn Fields, W.C.

British Postgraduate Medical School

Six lectures on fractures will be given by Prof. Hey Groves on Fridays from Feb. 7th to March 13th, and four lectures on cerebro-spinal syphilis by Dr. Gordon Holmes, F.R.S., on Mondays from March 2nd to 23rd. Both series will be held at 2.30 P.M. at the school, and applications for tickets should be sent to the dean. Further particulars will be found in our advertisement columns this week.

Demonstrations of Contraceptive Technique

On Thursday, Feb. 6th, at 2.30 P.M., a demonstration of the technique of the use of a variety of contraceptive methods will be given by Mrs. Marie Stopes, D.Sc., and Dr. Evelyn Fisher at the Clinic for Constructive Birth Control, 108, Whitfield-street, London, W.1. Tickets will be issued to medical practitioners and senior students who apply in writing to the hon. secretary at the clinic.

British College of Obstetricians and Gynæcologists

The quarterly meeting of the council of the College was held on Jan. 25th in the College House, when Sir Ewen Maclean, the president, reported that a loyal address had been sent to H.M. King Edward VIII. He reported further that the outline of a scheme for a national maternity service had been submitted to the Minister of Health. The report of the investigation into the use of analgesics suitable for administration by midwives was passed.

The following were elected to the membership of the College :—

Alan John Stewart Lawson Boyd, South Africa ; Mildred Isabel Ealing, London ; Barton Gilbert, London ; Stanley Henderson, Liverpool ; Edwin Holmes, Hove ; Charles Roy MacDonald, Sheffield ; John Sinclair MacVine, London ; Thomas N. MacGregor, Edinburgh ; Stanley Devenish Meares, Sydney ; Elizabeth Main Moore, London ; Frederick Walter Gifford Nash, Bedford ; John Gregory O'Donoghue, Melbourne ; Patrick Playfair, London ; Anthony Watson Purdie, Glasgow ; Cleveland Patrick Scott, London ; Edward Solomons, Dublin ; William Ralph Winterton, London ; Bryan Leslie Jeaffreson, Leeds ; Israel Goldberg, Cape Town ; Presley Archer McLeod, Ontario ; Cyril Macdonald Plumptre, Madras ; and Harold Rowntree, Lahore—the four last-named in absentia.

Post-graduate Course in Orthopædic Surgery

A special course will be held at the Royal National Orthopædic Hospital, 234, Great Portland-street, London, W.1, from March 9th to 21st. Applications should be made to the secretary of the hospital.

Journées Médicales de Bruxelles

This congress will be held from June 20th to 24th under the presidency of Prof. Robert Danis. Further information may be had from the secretary of the meeting, Dr. R. Beckers, 141, rue Belliard, Bruxelles.

Physical Exercise and Education

On Tuesday, Feb. 4th, and on the following three days, at 6 P.M., Dr. J. Alison Glover, senior medical officer of the Board of Education, will lecture at Gresham College, Basinghall-street, E.C., on some aspects of exercise, physical education and swimming. The lectures are open to all.

The Psychological Clinic and Community Welfare

Four lectures on this subject will be held at the Liverpool Psychiatric Clinic (56, Bedford-street North) on Wednesdays from Feb. 5th to 26th at 5.15 P.M. Juvenile courts, probation work, patrol work, and industrial and vocational psychology are the aspects which will be discussed.

A Memorial to Prof. A. F. Dixon

A meeting of friends and colleagues of the late Prof. Francis Dixon was held in the Common Room, Trinity College, Dublin, on Jan. 24th, to consider the establishment of a suitable memorial to him. In the absence of the provost of the college the meeting was summoned by the vice-provost, Mr. W. E. Thrift, who presided over the deliberations. Several projects having been discussed, a general committee was appointed to forward the movement, and an executive subcommittee was requested to study and report on the most suitable form of memorial. Prof. J. W. Bigger is acting as honorary secretary and Mr. G. A. Duncan, F.T.C.D., as honorary treasurer.

Standard Blood Counting Apparatus

A committee of the British Standards Institution have prepared a specification for hæmacytometer counting chambers and dilution pipettes. The institution is desirous that this draft should receive the widest possible consideration, so that the specification, when finally published, may command the greatest possible measure of agreement. A copy of the draft specification may be obtained, post free, on application to the Director, British Standards Institution, 28, Victoria-street, London, S.W.1, to whom suggestions for amendment of the draft may be sent. Any comments submitted will receive careful consideration when the draft is being revised for publication.

Association of Industrial Medical Officers

The second meeting of this association was held in the London School of Hygiene and Tropical Medicine on Friday and Saturday, Jan. 24th–25th, under the chairmanship of Dr. H. B. Trumper (Imperial Chemical Industries Ltd.), in the absence of Dr. Howard Mummery through illness. On Friday a discussion took place on Physical Standards in Industry, opened by Sir David Munro, secretary of the Industrial Health Research Board (whose address is summarised in a leading article on p. 265). He was followed by Dr. H. H. Bashford, chief medical officer to the Post Office. In the evening members dined together. On Saturday, Dr. T. O. Garland (Carreras Ltd.) read a paper on The Relation between the Industrial Medical Officer and the General Practitioner. He was followed by Dr. J. C. Bridge, chief medical inspector to the Home Office. Dr. Garland spoke of the importance of closer coöperation and contact between industrial medical services and other medical practitioners, and referred to the place of treatment in the industrial clinic. He also discussed briefly the position of the employee and employer in relationship to the industrial doctor. Dr. Bridge dealt with the relationship of the certifying surgeon to the industrial medical officer.

Medical Diary

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, Feb. 4th.
Orthopædics. 5.30 P.M. (Cases at 4.30 P.M.) Mr. Eric Lloyd: A Director for the Insertion of the Smith-Petersen Nail in Collum Femoris Fractures. Mr. E. P. Brockman: 1. Osteochondritis of the Head of the Radius. Mr. W. H. Ogilvie: 2. Deformity of Spine and Hips. Mr. T. T. Stamm: 3. Occupational Deformity of the Hands.
Pathology. 8.15 P.M. (department of pathology, Medical School, St. Thomas's Hospital, S.E.). J. Bamforth: 1. Carcinoma of Thymus with Malignant Cells in Sputum. 2. Teratoma of Testicle with Positive Friedman Test. 3. Endotheliomatous Change in a Uterine Fibroid. C. L. G. Pratt: 4. Effect of Toxins on Electrocardiograms of Animals. 5. Method of Constant Intravenous Injection in Anæsthetised Animals. J. St. C. Elkington: 6. Actinomycosis of Brain and Meninges. 7. Hæmangioma of Spinal Cord with Syringomyelia. 8. Oligodendroglioma of Third Ventricle. J. O. Oliver: 9. Gonococcus Ecto-antigen. 10. Hæmochromatosis with Analysis of Organs. 11. Widespread Hepatic Thrombosis. 12. Pulmonary Thrombosis with Calcification of Clot. N. R. Barrett: 13. The Examination of New Growths by the Wet Film Method. D. C. L. Derry: 14. Plasma-celled Myelomatosis. 15. Chronic Inflammatory Lesion of the Lung with Complete Necrosis of Spleen. 16. Rheumatic Carditis Associated with the Presence of Bacteria in the Mitral Valve. C. H. Wrigley: 17. Demonstration of Particles of Malignant Growths in Sputum.
WEDNESDAY.
History of Medicine. 5 P.M. Prof. Alexander Haddow: Historical Notes on Cancer from the MSS. of L. W. Sambon.
Surgery. 8.30 P.M. Sir W. Dalrymple-Champneys: The Sterilisation of Surgical Catgut (cinematograph).
THURSDAY.
Tropical Diseases and Parasitology. 8.15 P.M. Prof. R. T. Leiper: The Crustacea as Helminth Intermediaries. Dr. B. G. Peters: Some Recent Developments in Helminthology.
FRIDAY.
Otology. 10.30 A.M. (Cases at 9.30 A.M.) Mr. W. Stirk Adams, Mr. T. E. Cawthorne, and Dr. M. Mitman: Value of Radiology in Diseases of the Ear.
Laryngology. 5 P.M. (Cases at 4 P.M.) Mr. Maxwell Ellis: The Mechanism of Bronchial Movements and the Naso-pulmonary Reflex.
Anæsthetics. 8.30 P.M. Dr. I. W. Magill: Anæsthetics in Thoracic Surgery, with Special Reference to Lobectomy.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.
FRIDAY, Feb. 7th.—8.30 P.M. (De Vere Hotel, Kensington), Dr. Geoffrey Evans and Mr. Hamblen Thomas: Epistaxis.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.
MONDAY, Feb. 3rd.—5 P.M., Mr. A. M. Boyd: The Investigation of Peripheral Vascular Disease.
WEDNESDAY.—5 P.M., Mr. H. Osmonde Clarke: Injuries of the Carpal Bones.
FRIDAY.—5 P.M., Mr. F. H. Bentley: Wound Healing in vitro. The Interrelation of Epithelial and Fibrous Tissue Growth. (Hunterian lectures.)

GRESHAM COLLEGE, Basinghall-street, E.C.
TUESDAY, Feb. 4th, and 5th, 6th, and 7th.—6 P.M., Dr. J. Alison Glover: Some Aspects of Exercise, Physical Education and Swimming.

UNIVERSITY OF LONDON.
WEDNESDAY, Feb. 5th.—3 P.M. (London School of Hygiene, Keppel-street, W.C.), Col. L. W. Harrison: Venereal Disease.
FRIDAY.—11 A.M., Mr. H. E. Magee, D.Sc.: Nutrition.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
FRIDAY, Feb. 7th.—2.30 P.M., Prof. Hey Groves: Fractures (first of six lectures).

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.
WEDNESDAY, Feb. 5th.—4 P.M., Mr. W. H. Ogilvie: Carcinoma of the Tongue.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.
TUESDAY, Feb. 4th.—5.30 P.M., Dr. T. F. Cotton: Rheumatic Carditis.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle-street, W.C.
TUESDAY, Feb. 4th.—5 P.M., Dr. J. E. M. Wigley: Tuberculosis Cutis.
THURSDAY.—5 P.M., Dr. G. B. M. Heggs: Some Affections of the Skin of the Foot.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
WEDNESDAY, Feb. 5th.—2 P.M., Mr. Denis Browne: Empyema. 3 P.M., Dr. W. W. Payne: Vitamin Deficiency as a Predisposing Factor in Infection.
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Feb. 3rd.—3.30 P.M., Dr. Hinds Howell: Neurosyphilis (II.).
TUESDAY.—3.30 P.M., Dr. Critchley: Cerebral Vascular Disease (II.).
WEDNESDAY.—3.30 P.M., Dr. Kinnier Wilson: Clinical Demonstration.
THURSDAY.—3.30 P.M., Dr. Carmichael: Myopathic Diseases.
FRIDAY.—3.30 P.M., Mr. Elmquist: Demonstration of Re-educational Methods.
Out-patient clinic daily at 2 P.M.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, Feb. 3rd.—10 A.M., Medical wards and skin clinic. 11 A.M., Surgical wards. 1.30 P.M., Gynæcological wards. 2 P.M., Surgical wards, gynæcological and eye clinics.
TUESDAY.—10 A.M., Medical wards. 11 A.M., Surgical wards. 2 P.M., Throat clinic. 4.15 P.M., Mr. Woodd Walker: Derangements of Knee-joint.
WEDNESDAY.—10 A.M., Children's ward and clinic. 11 A.M., Medical wards. 2 P.M., Eye clinic. 4.15 P.M., Lecture on anæsthesia.
THURSDAY.—10 A.M., Neurological and gynæcological clinics. 2 P.M., Eye and genito-urinary clinics.
FRIDAY.—10 A.M., Skin clinic. Noon, Lecture on treatment. 2 P.M., Throat clinic.
SATURDAY.—10 A.M., Surgical and children's clinics, medical wards.
Operations, medical and surgical clinics daily at 2 P.M.
The lectures at 4.15 P.M. are open to all medical practitioners without fee.

ST. JOHN CLINIC, Ranelagh-road, S.W.
FRIDAY, Feb. 7th.—4.30 P.M., Mr. L. Attkins: Oral Sepsis in Relation to Physical Disease.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Feb. 3rd, to SUNDAY, Feb. 9th.—ST. JOHN'S HOSPITAL, 5, Lisle-street, Leicester-square, W.C. Afternoon course in dermatology (open to non-members).—ST. MARKS' HOSPITAL, City-road, E.C. All-day course in proctology.—WEST END HOSPITAL FOR NERVOUS DISEASES, Welbeck-street, W. All-day course in neurology.—ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W. Sat. and Sun. course in physical medicine.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Tues., 8.30 P.M., Mr. A. J. Cokkinis: Intestinal Obstruction. Thurs., 8.30 P.M., Mr. T. Holmes Sellors: Thorax.—Courses are open only to members and associates of the Fellowship.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.
WEDNESDAY, Feb. 5th.—4 P.M. (St. James' Hospital, Ouseley-road, S.W.), Dr. C. E. Lakin: Demonstration of Medical Cases.

LEEDS GENERAL INFIRMARY.
TUESDAY, Feb. 4th.—3.30 P.M., Mr. Flint: Demonstration of Cases.

LEEDS PUBLIC DISPENSARY.
WEDNESDAY, Feb. 5th.—4 P.M., Dr. H. H. Moll: Minor Allergic Diseases—Hay-fever, Urticaria.

UNIVERSITY OF DURHAM.
SUNDAY, Feb. 9th.—10.30 A.M. (Newcastle General Hospital), Dr. F. J. Nattrass: Medical Ward Visit.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, Feb. 5th.—4.15 P.M. (Royal Hospital for Sick Children), Mr. Alexander MacLennan: Orthopædic Cases.

Appointments

BLAIR, L. G., M.R.C.S. Eng., D.M.R.E., has been appointed Specialist Radiologist at the Dagenham Sanatorium.

KELLNER, ANDREW, M.D. Leipzig, L.M.S.S.A., Hon. Assistant Physician to the London Homœopathic Hospital.

LYON, D. MURRAY, M.D., F.R.C.P. Edin., Principal Medical Officer of the Scottish Widows' Fund and Life Assurance Society.

MACLEOD, DONALD, F.R.C.S. Edin., Clinical Assistant at All Saint's Hospital for Genito-urinary Diseases, London.

SLATER, EFFIE, M.B. Lond., D.O.M.S., Assistant Medical Officer to the Education Committee of Wolverhampton.

Medical Referee under the Workmen's Compensation Act, 1925: PERCIVAL JOHN HAY, M.D., of Sheffield, for all County Court Districts at present comprised in Circuits Nos. 13 and 18, with a view to his dealing with ophthalmic cases.

Certifying Surgeons under the Factory and Workshop Acts: Dr. OLIVE G. COLDICOTT (Abergavenny, Monmouth); Dr. W. E. FAULKNER (Alva, Clackmannan); and Dr. J. H. ALLAN (Chorley, Lancs).

Dr. J. B. Albury has been appointed a member of the legislative council of the Bahama Islands.

Dr. D. C. Norris (Inner Temple) and Dr. F. Collar (Middle Temple) have been called to the Bar.

NOTES, COMMENTS, AND ABSTRACTS

THE PSYCHOLOGY OF INTERNATIONAL RELATIONS*

BY WILLIAM BROWN, D.M. Oxon., D.Sc., F.R.C.P. Lond.

WILDE READER IN MENTAL PHILOSOPHY, UNIVERSITY OF OXFORD; LATE MAJOR, R.A.M.C., AND NEUROLOGIST TO THE FOURTH ARMY, B.E.F., FRANCE

THE psychology of international relations, otherwise the psychology of peace and war, can be adequately discussed only on the basis of a scientific knowledge of the structure and working of the human mind. A number of questions open out: how war is possible; how it can be carried on at all by civilised people; how peace can be achieved, this last only by a positive policy, never by laissez-faire.

Hobbes said that peace was merely an interval between wars, the wars being the real—meaning the normal—activity, and peace a breathing-space, a time when people are tired, disillusioned, and a little penitent. Those who take part in war customarily declare that when they have finished this business they will fight no more. The protestation has much the same value as that of the drunkard who exclaims as he lifts the glass to his lips that it is the last time.

Speaking as a psychologist, not as a politician, I am convinced that the latest war is not the last. In saying this I do not mean to be pessimistic, I am merely speaking as I would about a manic-depressive patient who, after a state of deep depression, passes into one of exaltation and feels that never again will his old symptoms return. With a patient like that we know that he will have another relapse sooner or later, and that no amount of suggestion or encouragement will make any difference. It is of no use telling him or his relatives that "All's well with the world"; a relapse is as certain as anything can be. In cases of manic-depressive insanity or the milder cyclothymia, as in other forms of psychoses as distinct from psychoneuroses, a radical cure has not been found. No psychotic has ever yet been cured by psychotherapy as such, although psychotherapy and psychology in general have enabled us to gain a deeper insight into the psychotic's state of mind, and sometimes to ameliorate the condition. We may cure or improve the hysteric, the psychoneurotic, but the psychotic still escapes us—although improvement, and sometimes spontaneous recovery, may occur.

So it is with war and peace. We cannot pretend as psychologists that a solution has been discovered at present. All we can do is to go on and disentangle the various forces which are at work to produce war. The causes of war are numerous, and many of them seem to have little to do directly with human nature. The economic causes of war spring at once to the mind. According to some systems of practical economics wars are inevitable and must occur from time to time. Conflicts of interests exist between nations and may become so severe that an appeal is at last made to the ultima ratio, the final court of trial by brute strength.

Again it is necessary to make the psychologist's position clear. As a psychologist I am not advocating any particular system of economics as distinct from others. We psychologists feel some sympathy with the economists, for we are in the same boat. Psychology and economics are the two sciences about which the man in the street thinks he knows as much as the expert. He is not going to be informed about his own mind, for who should know his own mind better than himself? He knows all about economics too, for does he not have to deal continually with credit balances and deficits? That is one reason why progress in these sciences is so slow.

Man's Reactions to His Mind

Deep down in the mind—in our "heart of hearts," as we say—we are aware of the struggle for existence, the desperate fight between man and man, family and family, nation and nation, for security, position, and power, a fight variously disguised, halted by compromise and mutual adjustment, but at times flaming into open war. Schopenhauer in one of his "Occasional Essays" likened human society to a number of hedgehogs that found themselves getting chilly in the winter and so got closer and closer together to keep one another warm, but as they drew closer their prickles hurt one another, and so they moved away and got cold again, and eventually by trial and error found an optimum distance from one another at which they could keep fairly warm and at the same time escape hurt. So it is with man in society. He finds it difficult to harmonise with others, and yet if he went "on his own" his life would be "nasty, brutish, and short," to quote Hobbes's phrase, and so coöperation to a certain extent is forced upon him.

That, of course, is not a very close analogy, because society is not a matter of deliberate social contract, but has grown in relation to the needs of individuals, and individuals have never existed by themselves, but always within some system or family, and thus their social instincts and their ego instincts have developed pari passu. We cannot deduce the social behaviour of man from his purely individual behaviour, and, in fact, there is no such thing as purely individual behaviour because man is always acting as a member of some group and generally as a member of a number of groups simultaneously. It is not that psychology deals with the individual man while sociology and anthropology and other sciences deal with his social relations. At every point the individual is reacting to the society to which he belongs.

A purely economic theory of the cause of war might have a corresponding psychological theory, very simple, and therefore inadequate—namely, that man gets annoyed when his interests are threatened, irritated when his will to live is thwarted, economic difficulties make him angry, and when his misfortunes and the reason for them are declared to him by some demagogue he may in his irritated state become pugnacious and ready to fight. That theory is simple, as I have said, but very inadequate, because it takes practically no account of the structure of the mind. The individual mind has developed through countless generations from the most primitive condition with reference to a very real struggle for existence. We must accept in its general outline the Darwinian theory of natural selection and the survival of the fittest, for the mind as for the body. But although the mind has developed to a certain degree and it is possible for coöperation to supplement competition, and for man to become more and more coöperative and less and less competitive, nevertheless he still carries with him tendencies towards more primitive forms of mental reaction such as were appropriate to the early stages of national and social evolution, but are not so obviously appropriate now.

Primitive Urges

We observe this very clearly in criminal behaviour. A great deal of such behaviour is a relapse or a regression to a more primitive reaction of the organism. The murderer is not always someone whose reactions to life have been perverted, but often someone who, through disease of the nervous system or developmental degeneration, perhaps transmitted from parent to child, resulting in weakness of mental and nervous control, reacts as his primitive ancestors

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ages ago reacted in an environment where such reactions would be accounted normal. He wants a man's watch, and the most direct method is to kill the owner. He yearns for the taste of roast pig, and so he burns down the house. Many of these severe cases of criminality resist every type of treatment, punitive or reformatory, because they are themselves primitive in this particular direction. In some ways they are a reversion to type, a "throw back" to a much earlier level of evolution.

All this means that civilised man, the modern *Homo sapiens*, carries with him possibilities of behaviour that are appropriate to the earlier stages of mental development, but are customarily held in check or superseded by more developed methods of reaction. On analysis one finds that most people who are regarded as normal still retain far down in their unconscious mind—that is, on the primitive levels of mentality—tendencies that were appropriate in the early stages of human development but are no longer allowed to be dominant.

One of these primitive tendencies is that of self-preservation, present in all of us, but held in check by higher considerations; in part such urges have been not destroyed or neutralised, but directed in the course of evolution to higher social and cultural ends. But a good deal of the old urge remains at its most primitive levels, even in the most highly developed man, so that in certain conditions of great danger, especially when accompanied by ignorance of what exactly is happening, the urge for self-preservation may leap forward with overwhelming force, and he may take refuge in panic-stricken flight, to his own great disgust afterwards. It is the same with the urge not only to preserve our lives but to assert ourselves, to extend and enlarge our powers. This again may be held in check by various mental mechanisms of later development, by the grace of modesty, by self-criticism, by consideration for others, by a regard for what is decent, even by a sense of proportion in things, and, which follows from it, a sense of humour; yet nevertheless, deep down in the mind, some of this self-assertive tendency remains, and given the occasion may blaze out very much in its original form. This, again, can happen in the most highly developed of men.

One of the many occasions when these primitive tendencies can show themselves uncensored and unreproved is in a great mass movement where the individual feels the safety and security of the crowd around him, all thinking in the same way, and his sense of responsibility to himself is greatly lightened. He does not deliberately give way to more primitive tendencies, but those primitive tendencies are always ready to come forward and manifest themselves through more complicated civilised behaviour. They are like a charge of electricity suddenly short-circuiting a delicate installation, overcoming all resistances, and lighting the landscape with a lurid flame. Thus a crowd may fall into a panic and in such a state take the slightest occasion for action utterly out of proportion to the circumstances. It may when aroused spring savagely like a tiger without reck or consideration even for its own safety. Yet in that crowd, moved by the same impulses and intent on the same wild course, may be men who individually would never dream of acting in that way. That situation was recognised long before any analytic work had been done upon the mind. The crowds of the French Revolution, for example, and the excesses which they committed were the subject long ago of psychological study.

Mass Psychology

The possibility of mass mental reactions or mass psychoses has an obvious bearing upon the problem of war and peace, but the deeper analysis of the mind in recent times inaugurated by Sigmund Freud has shown to how great an extent mental forces can continue to manifest themselves in an unconscious form, even while the conscious mind is fully alert and apparently in full control. All these forces that come up so obviously in mass movements are working also in the individual mind and showing themselves in distorted forms. Even mental reactions that the majority of people would recognise as perfectly normal and appropriate to the circumstances can by analysis be traced back to still more primitive tendencies from which they derive their energy. It is as if a person who belonged to a wealthy family used the leisure that his inherited wealth made possible to become highly cultured, deeply read, artistically appreciative, while yet the money which enabled him to do this came from the labour of many of his own species, hewing minerals from the bowels of the earth at great toil and risk and with little reward. The example that springs to the mind is that of Greek culture during the golden age in Athens, a culture which was, of course, founded upon slavery. Slavery was justified even by Aristotle. The arguments are familiar, they are biased, and can be used in different ways to point to different conclusions. I am using it here only as an analogy, and indeed as an analogy it does not completely hold, because the forces in the unconscious in our highly developed cultural life are not in themselves good or bad, they just represent biological or mental energy.

Among them are these primitive forces of self-preservation and self-assertion. Both in their measure are needed. Unless we are able to preserve our lives we shall do no good to anyone. Self-assertion, too, is obviously good in a general sense, though it can be directed in such a way as to be a curse to everyone concerned. It is all a matter of direction, and in the cultured life it is directed adequately. With that cultured outlook on life these fundamental forces have to be kept at bay, under control, used as the powers of nature are used in an industrial civilisation. Used in a different way they may result in institutions and forms of thought which are irreconcilable with ultimate peace between individuals or between nations. It comes to this, that he who wills the means wills the end. A certain outlook on life, a certain direction or misdirection of the internal forces may involve ultimately such a conflict as can only be settled by an appeal to force.

The Rule of Law

It is often said that war could be prevented in the same way as duelling has been prevented, by legal process. Might not the appeal to force as between nation and nation be brought to an end if it were declared illegal? But it must be remembered that a law, although ultimately it may be in harmony with the moral outlook of the great majority of individuals, needs force to sustain it. In separate communities it is sustained by police. An international law binding the nations would need to be supported by force at the present stage of human evolution. From a psychological point of view it seems to me an obvious implication that we need a supernational institution with adequate force at its disposal to support the decisions of international law. That is not within the bounds of practical politics at the present time. No nation would surrender its sovereignty to a super-state. Such quixotism is not to be found now upon the earth. The only alternative to this—I do not want to lecture on the subject, but to consider it only in relation to psychology—is a pis aller or second best, a system of collective security through the League of Nations.

For that to be really successful it should be universal. The League of Nations must include the whole world, because peace is a matter which affects the whole world, especially in view of the rapidly extending lines of communication and the physical, economic, and cultural contacts of all countries. A true League of Nations must include every nation, and then the principle of collective security may be capable of being maintained and the primitive passions of separate nations held in leash. But as things are at present there is no immediate prospect of a complete League, and to the extent to which it is incomplete, psychologically speaking—and again

I am not speaking as a politician—its prospects of success are greatly diminished. It is even a question whether, in such a situation, it is not better to recognise the difficulties, and seeing that there is not an adequate force at the disposal of the League to impose its decisions, to keep those decisions as expressions of moral opinion, otherwise the League may involve more fighting and not less. But the more courageous way is to organise economic (as distinct from military) sanctions to the utmost of which the nations now members of the League are capable, and thus to bring *forcibly* home to an aggressor the collective moral disapprobation of his aggression.

Mobilisation of the Unconscious

It may be asked how it is possible for any individual who has enjoyed the benefits of modern culture and has acquired self-control to be brought to such a state of mind that he can kill another with whom he has no personal quarrel. In the quiet and even friendly atmosphere of the laboratory a man may, in his scientific enthusiasm, concern himself with aeroplanes and armament of various kinds, forgetting the use to which they are to be put; but how is it possible for him to fire the guns, explode the munitions, drop the bombs, release the poison gas, knowing that the result will be the killing and maiming of his fellow-creatures? In other words, how is it possible for anyone to take part in war? That is a psychological problem which each of us must put to himself. In the last war there were a number of people who refused to have anything to do with it. They were all classed together as conscientious objectors, though in fact the motives behind their refusal differed along a wide range. In fact, they had only this in common, a strongly individualistic turn of mind, and indeed it needed to be strong to withstand the tremendous mass suggestion which was surging around them.

But the great majority of people were swept along on the wave of popular feeling, and, I suppose, in the circumstances of 1914 as they presented themselves to the normal mind at that time, with all that people learned or were told of the events preceding the outbreak and those of the first months of the war, active participation in or support of the war seemed to be called for by the reason and conscience of the individual as well as by the authorities of the State. The unconscious was being mobilised at the same time as the mobilisation of the army and navy.

Nevertheless, I think it may be stated that if the individual man was fully aware of all the unconscious forces at work his participation in war would at any rate be more hesitating, his mind more a prey to misgiving. Here let me say I am not approaching the subject of participation or non-participation from the point of view of ethics or religious conviction. Those are the ultimate court of appeal, but we are not dealing with them at the moment. It is purely a question of the facts at our disposal and appropriate action on them. My contention is that we have not all the psychological facts at our disposal when we endeavour to sum up this question of our duty. If the psychological panorama were cleared of the smoke screen we should not at all events have that terrible contradiction whereby opposing peoples take up arms against one another to the glory of God, each appealing to Him for victory.

Forces on Leash

All this, I know, is a platitude, but it has to be mentioned in order that we may face up to the psychological problem. The unconscious urges which are demanding satisfaction have to be remembered. These are not just skeletons in the cupboard, they are very live and potent forces. The tiger is there, and the wolf, and the jackal, and the snake, and we must not forget the donkey. These are at all ordinary times held in check by our conscious aims and purposes, and in general by our culture, our sense of what is due to others and admirable in ourselves. But the working of these unconscious forces can distort our moral judgment, so that for example during the last war we had quite kindly and well-educated people uttering such sentiments as that "the only good German is a dead German," though this became less pronounced as the war went on and weariness and disillusionment developed. We have to ask ourselves the question, what strange mentality settled upon them that they could deny all that culture and social contacts had brought them and be as bloodthirsty as their primeval ancestors? It is true that the Germans had invaded Belgium; that and other things were fuel for the eager fire. Behind it all was the deep conviction that a man must be ready to fight for his king and country and to preserve the life and honour of his own.

Those were the motives on the surface, and it is true that once war had begun there was a certain responsibility upon the shoulders of everyone to see that it was prosecuted with the utmost efficiency.

> "Theirs not to reason why,
> Theirs but to do and die"—

and this they did, acting according to whatever plans were devised by the higher command. The whole nation was working as a nation on the principle of self-preservation. The individual was drawn up into the national life in a way which certainly that generation had never known before. His unconscious had the texture of the unconscious of all the other members of the nation.

The same thing happens in times of revolution. The leader, so called, at such times is really the man who stands for the unconscious of all the people whom he leads. People have the leaders they deserve or demand. The leader is the man who satisfies not only their conscious demands but their unconscious urges. But that is a thing which is always overlooked and will continue to be overlooked by the mass of educated people for a long time to come.

Propaganda and Proper Geese

It is seen fairly clearly now that if peace is eventually to be achieved economic science must give of its best, and what it gives must be acted upon; but it is not seen with equal clearness that psychological science must also give of its best, and that what it gives must be acted upon. Up to now there has been a good deal of perverted use of psychology in relation to war and peace—I refer to its use in connexion with propaganda. As soon as war breaks out no doubt it is morally right to use propaganda on each side to the utmost extent. It is the propaganda that takes place before war that is so devilish. By propaganda I mean here, to use a simple word, lying, the distortion of facts. Such propaganda is successful enough, given the proper geese, the people ready to accept the lies or the false emphasis. Propaganda for ulterior motives makes it difficult even for the best educated individual to arrive at the facts. He seeks for them and does not get them, whatever newspaper he takes. One of the great needs of the world is for complete truthfulness, but lying and chicanery are part of the very art of war.

As an illustration of how psychological motives in war may work, in another country it was said that in the last war they had been brought in to support financial interests, the interests of people who had invested heavily and risked a great deal of wealth in support of other nations engaged in that war. I am not saying that that was true, but only that if it were true we should have a primitive motive—namely, the desire for gain, or the desire to escape financial ruin—supporting and energising more lofty moral considerations.

But if it is possible, as indeed it is, on the fully conscious plane to have deliberate mis-statements and misdirection and deception and appeal to prejudice, and fixed ideas about the duty to fight, and the slogan "My country right or wrong,"—if

that is possible on the purely conscious level, how much more danger must there be in appeals directed to unconscious forces in the mind? I have spoken already of the instinct of self-assertion. The desire for power and prestige goes hand in hand with the sense of the importance of one's family, or college, or country, and so from the depths of the unconscious there is a continuous line or channel of energetic mental development. Such self-assertion can be very rigid and intractable. It can be distorted in all sorts of ways and disguised in scarcely recognised forms. One of the most overwhelmingly successful ways of disguising it from ourselves is to moralise it, to say that we have a duty to this, that, or the other, and to let that sense of duty reinforce what is, when uncovered, the working instinct of self-assertion or desire for power of a ruthless kind—ruthless, I say, because it arises from some primitive state where the individual neither knew nor received pity.

Aggression pure and simple in the unconscious is a primeval factor, the kind of thing that enables the soldier to kill his enemy when he "sees red." The word "sheep" has sometimes been applied to the soldier type of mind, but there is something much more positive than that about it. I am well aware, of course, that what I am saying is incomplete. On the other side there is the desire, equally fundamental, for fellowship, for love. It is from the refusal of love that a great deal of aggression springs. The little child wants to be loved and is ready to love, but if it does not receive love from its parents it is likely to become an intractable child, hostile and aggressive. Such aggressiveness is not primitive, it is secondary to the denial of love.

I feel that it is the same between nations. One nation wishes the friendship of another; it would rather be the ally of the other than its enemy. But if its overtures are rejected a revulsion of feeling may take place such as that which overwhelms the scorned lover. There is thus a primary aggressiveness which comes out in battle and murder, but there is also a secondary aggressiveness which is very much more widespread and can manifest itself in its own way. There is the further danger in the situation that the primitive tendency to self-sacrifice, to injure oneself, may, when linked up with the ideal of national duty, supply a new fund of energy, and thus bring about war or keep a war going after it has broken out, and the cunning propagandist realises this and appeals to that very sentiment.

All these are factors which provoke and sustain war. I hope I have made it clear in the compass of a short address how much dangerous and explosive material there is which will have to be dealt with and cleared out of the way before peace can be ensured. It is rightly said that moral disarmament must precede material disarmament, but even before moral disarmament there must be a psychological assessment not only of those "inward parts" which, on the highest of all authority, may be "full of ravening and wickedness," but also of still more deep-seated or primitive mental tendencies that in themselves are neither moral nor immoral.

NEW PREPARATIONS

MULTIVITE PELLETS.—In presenting their new chocolate-covered pellets, containing vitamins A, B_1, B_2, C, and D, the British Drug Houses Ltd. (London, N.1) quote a statement that "the interest which vitamins hold for the physician is not alone in their relation to certain well defined diseases . . . but rather in the fact that chronic vitamin deficiency produces numerous vague, borderline states of ill-health which often puzzle the physician and disable the patient." It is impossible, they say, to ensure that the normal daily dietary under modern conditions is rich in the necessary vitamins, and they mention anorexia, gastric distension, constipation, nervous disorders, dental decay, certain forms of anæmia, and a feeling of being "out of sorts" as possible consequences of slight but general vitamin deficiency. Multivite Pellets have been made in response to a demand for a well-balanced vitamin concentrate which would be acceptable to adults and convenient for use in private practice and among hospital patients and out-patients. Each contains vitamin A 3000 international units, vitamin C 100, and vitamin D 600, with vitamin-B complex equivalent to 2·0 grammes of distillers' yeast. The suggested dose is for children 1–2 pellets daily and for adults 2–4. Samples are obtainable on application.

HEWSOL is described as a non-poisonous, non-corrosive germicide consisting of a pine oil treated by a special process and combined with a neutral soap so as to give a perfect emulsion when mixed with tap-water in the proportions recommended. It may be used undiluted on dressings applied to wounds, but as a general lotion 5–8 per cent. solutions are suitable. Apart from abrasions and cuts it may be used for douches, baths, and disinfectant sprays and for washing contaminated linen; its destructive action on cultures of *Bacillus typhosus* (Rideal-Walker coefficient) is stated to be five times that of carbolic acid. The proprietors, Messrs. C. J. Hewlett and Son, Ltd. (35, Charlotte-street, London, E.C.2), claim in addition that Hewsol is non-staining, non-irritating, free from cresol and xylenol derivatives, and economical in use. It has a pleasant smell.

USES of ACRIFLAVINE.—The Boots Pure Drug Company Ltd. (Nottingham) have issued an interesting booklet describing the properties and many uses of the acridine antiseptics, with special reference to the Boots preparations of acriflavine, neutral acriflavine (euflavine), Acriflavine Emulsion, Burnol Acriflavine Cream, and proflavine. An enclosure is devoted to the use of acriflavine derivatives in gonorrhœa, where they are not only employed for local irrigation but also—with reservations—administered by mouth or by injection. Acriflavine Emulsion is recommended particularly as a dressing for wounds, septic conditions, burns and scalds, and ophthalmic inflammation or injuries.

SALICIN.—This drug, a glucoside obtained from willows and poplars, introduced as an anti-rheumatic in 1874, has suffered partial eclipse by sodium salicylate and allied compounds. To show that this eclipse is undeserved the three manufacturers in Great Britain (J. F. Macfarlan and Co., 32, Bethnal Green-road, London, E.1; T. and H. Smith Ltd.; and Whiffen and Sons, Ltd.) have prepared a statement of the value of salicin in medical practice and offer to supply samples of powder or tablets. They claim that it has none of the depressing or irritant effects of salicylates and that clinical experience has proved its usefulness in the treatment of influenza and rheumatism, and also of psoriasis and other skin diseases.

THE ALFRED EICHHOLZ CLINIC

THE Alfred Eichholz Clinic, 204/206, Great Portland-street, London, W.1, has issued a further edition of its handy scribbling pads, on the covers of which are depicted scenes from medical history. The latest is a reproduction from the well-known picture in Barber Surgeons-Hall, of Sir Charles Scarborough, first physician to Charles II., James II., and William III., and Edward Arris, serjeant-surgeon to Charles II.

NORTH HERTFORDSHIRE AND SOUTH BEDFORDSHIRE HOSPITAL, HITCHIN.—The Duchess of Gloucester opened a new men's ward and a new children's ward at this institution on Jan. 17th. The extensions cost £15,000 and are the first completed part of a £35,000 scheme. Nearly £900 in purses was presented to the Duchess. The children's ward is to be known as the Gloucester ward.

Vacancies

For further information refer to the advertisement columns

Aldrich Blake Travelling Scholarship.—200 guineas.
Ashton-under-Lyne District Infirmary.—H.S. At rate of £150.
Barbados General Hospital.—Sen. Res. Surg. £450.
Bath, Royal United Hospital.—H.S. At rate of £150. Also Hon. Med. Reg.
Beckenham, Bethlem Royal Hospital, Monks Orchard.—Jun. Asst. Phys. £350.
Bexley Urban District Council.—M.O.H. £800.
Birmingham City, Maternity and Child Welfare Dept.—Temp. M.O. £10 per week.
Birmingham Maternity Hospital.—Res. M.O. and Reg. £200.
Birmingham, Queen's Hospital.—Bacteriologist and Clin. Pathologist. £600. Also Res. Surg. Reg. £100.
Blackburn Royal Infirmary.—Res. Surg. O. £250. Also H.S. £175.
Bradford Royal Infirmary.—H.S. At rate of £135.
Buxton Clinic for Rheumatism and Allied Diseases.—H.P. At rate of £200.
Cambridge, Papworth Village Settlement.—H.P. £200.
Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.
Canterbury, Kent and Canterbury Hospital.—H.P. At rate of £125.
Colchester, Royal Eastern Counties' Institution for the Mentally Defective.—Asst. M.O. £350.
Coventry and Warwickshire Hospital.—Res. Cas. O. £125.
Dewsbury and District General Infirmary.—Sen. H.S. £200.
Doncaster Royal Infirmary.—H.S. to Eye and Ear, Nose, and Throat Depts. £175.
Downpatrick, Down Mental Hospital.—Jun. Asst. M.O. £300.
Dulwich Hospital, S.E.—H.P. At rate of £120.
East Ham Memorial Hospital, Shrewsbury-road, E.—H.P. At rate of £150.
Edmonton, North Middlesex County Hospital.—Jun. Res. Asst. M.O. At rate of £250.
Egyptian Government.—Director of Lunacy Division in P.H. Dept. L.E. 1020 to L.E. 1200.
Hull City Hospital for Infectious Diseases, Cottingham.—Res. M.O. £350.
Hull Royal Infirmary.—Second Cas. O. At rate of £150.
Infants Hospital, Vincent-square, Westminster.—Res. M.O. £300. Also two Physicians to Out-Patient Dept.
Lambeth Hospital, Brook-street, S.E.—Asst. M.O. £350.
Leeds General Infirmary.—Hon. Asst. Phys.
Leeds University.—Chair of Physiology. £1000.
Liverpool Hospital for Consumption and Diseases of the Chest.—Res. M.O. £150.
London Hospital, E.—Medical 1st Asst. and Reg. £300.
London Lock Hospital, Harrow-road, W.—Surg. Reg. to Dean-street Male Lock Hospital. £100.
Middlesbrough County Borough.—M.O.H. £1100.
Middlesex Hospital, W.—Fracture and Orthopædic Registrar. £300.
Mile End Hospital, Bancroft-road, E.—Asst. M.O. £350.
Newcastle-upon-Tyne, Hospital for Sick Children.—Res. Surg. O. £250.
Northampton County Mental Hospital, Berrywood.—Second Asst. M.O. £450.
Nottingham Children's Hospital.—Res. H.S. At rate of £150.
Nottingham General Hospital.—Cas. O. At rate of £150.
Paddington Hospital, Harrow-road, W.—Asst. M.O. £350.
Perth Royal Infirmary.—Sen. H.S. £250.
Portsmouth City.—Visiting Consultant Obstetrician. £200.
Preston, Sharoe Green Hospital.—Sen. Asst. Res. M.O. Also Jun. Asst. Res. M.O. At rate of £200 and £100 respectively.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Res. Anæsthetist. At rate of £100. Res. Anæsthetist and Dist. Res. M.O. At rate of £90. Also Asst. Res. M.O. At rate of £80.
Queen's Hospital for Children, Hackney-road, E.—Res. M.O. At rate of £200. Also H.S. and Cas. O. Each at rate of £100.
Romford, Oldchurch Hospital.—Asst. Res. Radiologist and Jun. Res. M.O. Each £250. Also General Consulting Phys. £300.
Royal National Orthopædic Hospital, 234, Great Portland-street, W.—Asst. Res. Surg. for Country Branch. £250.
Royal Naval Medical Service.—Eight vacancies.
Royal Northern Hospital, Holloway, N.—H.P. Also Obstet. H.S. Each at rate of £70.
St. Alfege's Hospital, Vanbrugh Hill, S.E.—Asst. M.O. £350.
St. Andrew's, Devons-road, E.—H.P. At rate of £120.
St. George-in-the-East Hospital, Raine-street.—Asst. M.O. £350.
St. John's Hospital, Lewisham, S.E.—Med. Reg. to Out-patients. 50 guineas.
St. Leonards-on-Sea, Buchanan Hospital.—Hon. Surgeon.
St. Peter's Hospital, Vallance-road, E.—Asst. M.O. £350.
Sheffield Children's Hospital.—H.S. At rate of £100.
Sheffield Royal Hospital.—Clin. Asst. to Ophthalmic Dept. Also Clin. Asst. to Ear, Nose, and Throat Dept. Each £300.
Shrewsbury, Royal Salop Infirmary.—Res. H.S. At rate of £160.
Shrewsbury, Salop Mental Hospital.—Asst. M.O. £350.
Stockport Infirmary.—H.S. and Cas. O. £150.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. At rate of £150.
Waltham Abbey, Board's Isolation Hospital.—Res. M.O. £650.
West London Hospital, Hammersmith-road, W.—Half-time Pathologist. At rate of £300.
West Riding of Yorkshire County Council.—School Medical Inspector. £500.
Winchester, Royal Hampshire County Hospital.—Asst. Hon. Clin. Pathologist.
Windsor, King Edward VII. Hospital.—Hon. Asst. Surg.
Woolwich and District War Memorial Hospital, Shooters Hill, S.E.—H.P. At rate of £100.

Births, Marriages, and Deaths

BIRTHS

BRADE-BIRKS.—On Jan. 26th, at the City of London Maternity Hospital, Hilda Kathleen Brade-Birks, M.Sc., M.B. Manch., wife of the Rev. S. Graham Brade-Birks, D.Sc., of Godmersham, Canterbury, of a daughter.

DUFFETT.—On Jan. 20th, at Plymouth, the wife of Edward C. Duffett, M.R.C.S. Eng., of a son.

GARLAND.—On Jan. 23rd, at Leeds, wife of Dr. Hugh Garland, of a daughter.

HADLEY.—On Jan. 16th, the wife of John A. Hadley, F.R.C.S. Edin., of Lincoln, of a son.

MORRISON.—On Jan. 17th, at Leeds, the wife of Dr. J. Morrison, Halifax, of a son.

ROWLANDS.—On Jan. 26th, at Wimpole-street, W., the wife of Dr. John Rowlands, of a son.

SANDELL.—On Jan. 23rd, at Wilbraham-place, S.W., the wife of David H. Sandell, M.D., F.R.C.S. Eng., of a daughter.

WHITTLE.—On Jan. 23rd, 1936, at Brookfield, Cambridge, to Phyllis (née Fricker), wife of Dr. C. Howard Whittle—a son.

MARRIAGES

DALRYMPLE SMITH—RILEY.—On Jan. 23rd, at St. Joseph's, Richmond, Yorkshire, Angus Dalrymple Smith, M.B., F.R.C.S. Edin., to Rowena, younger daughter of Mr. Herbert Riley, of Richmond, Yorks.

PASMORE—CALMAN.—On Jan. 22nd, at Kingston Vale, Dr. Stephen Pasmore to Dr. Jean Calman, daughter of W. T. Calman, C.B., D.Sc., F.R.S., and Mrs. Calman, M.B.

SANDEMAN—CUNNINGHAM.—On Jan. 22nd, at Perth, Charles Stewart Sandeman, M.B., Ch.B. Edin., to Eva Margaret, daughter of the late James Cunningham and Mrs. Cunningham, St. Andrews.

DEATHS

BLAIR-BELL.—On Jan. 25th, Prof. William Blair-Bell, M.D. Lond., F.R.C.S. Eng., F.C.O.G., West Felton, Shropshire, aged 64.

BROOKE.—On Jan. 15th, at Singapore, Gilbert Edward Brooke, L.R.C.P. Edin.

COLQUHOUN.—On Jan. 23rd, at a nursing-home, William Brooks Colquhoun, M.R.C.S. Eng., aged 76.

GWYNN.—On Jan. 20th, at Brighton, Edward Betton Gwynn, M.B. Edin., eldest son of the late Samuel Betton Gwynn, F.R.C.S. Eng., L.R.C.P., of Wem, Shropshire.

HARRISON.—On Jan. 24th, suddenly, at Worthing, Henry Leeds Harrison, M.B. Camb.

JONES.—On Jan. 20th, at St. Clears, South Wales, Valentine Llewellyn Watson Jones, M.R.C.S. Eng., in his 83rd year.

MAXWELL.—On Jan. 24th, at Yeomans, Wrington, Somerset, Herbert Bowen Maxwell, M.R.C.S. Eng.

MORRIS.—On Jan. 23rd, at Harrogate, Richard John Morris, C.B.F., M.D. Durh., aged 75.

SHEPPARD.—On Jan. 22nd, at Crockham Hill, near Edenbridge, Kent, Amy Sheppard, O.B.E., M.B. Lond., D.P.H. Camb., late of Harley-street, W.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE FOTHERGILL TESTIMONIAL FUND

THE following is the first list of subscriptions received in response to the letter published in the *British Medical Journal* and *The Lancet* of Jan. 18th

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